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**INDIAN OCEAN  
GEOLOGICAL, GEOPHYSICAL, AND  
OCEANOGRAPHIC DATA CATALOG  
USNS WILKES 1977-1979**

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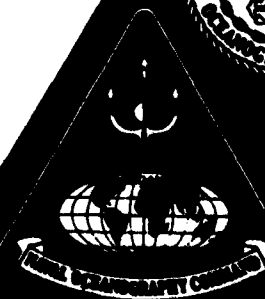
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## FOREWARD

The Indian Ocean remains as one of the critical areas to the free world. During the period of May 1977 to December 1979, the USNS WILKES conducted geological, geophysical and oceanographic surveys throughout the Indian Ocean. These survey efforts have enhanced our knowledge of the environment and strengthened the Navy's ability to operate in this region. This report summarizes the type, amount, and location of the environmental data and provides a useful reference for the data base.

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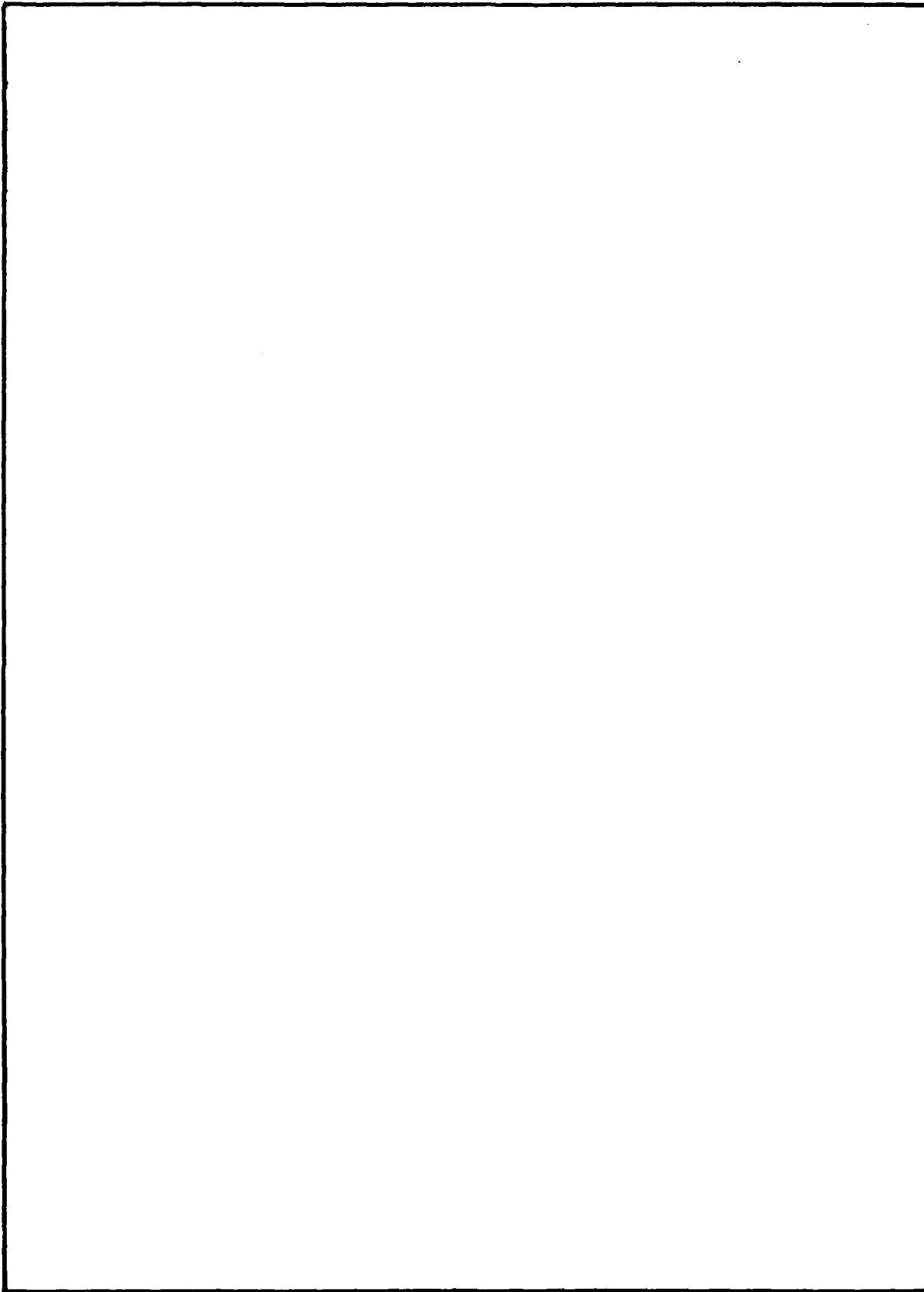
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## CONTENTS

|      |   |    |
|------|---|----|
| I.   | BACKGROUND                                      | 1  |
| II.  | INTRODUCTION                                    | 2  |
|      | A. SURVEY TRACKS                                | 2  |
|      | B. MEASUREMENTS                                 | 2  |
|      | C. DATA ACQUISITION                             | 5  |
|      | D. NAVIGATION                                   | 9  |
| III. | UNDERWAY DATA                                   | 10 |
|      | A. SEISMIC-REFLECTION PROFILES                  | 10 |
|      | B. 3.5 kHz SHALLOW SUBBOTTOM PROFILES           | 11 |
|      | C. TOTAL MAGNETIC INTENSITY                     | 12 |
|      | D. BATHYMETRY                                   | 12 |
|      | E. SEA SURFACE TEMPERATURE                      | 13 |
| IV.  | STATION DATA                                    | 14 |
|      | A. BOTTOM SEDIMENT CORES                        | 14 |
|      | B. WIDE ANGLE BOTTOM REFLECTION (WABR) STATIONS | 15 |
|      | C. OCEANOGRAPHIC STATIONS                       | 16 |
|      | D. EXPENDABLE BATHYTHERMOGRAPHS (XBT)           | 17 |
|      | REFERENCES                                      | 18 |

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## FIGURES

|    |   |    |
|----|---|----|
| 1. | INDIAN OCEAN SURVEY TRACKS, USNS WILKES, APRIL 1977 -<br>DECEMBER 1979. | 19 |
| 2. | GENERALIZED INDIAN OCEAN BATHYMETRY                                     | 21 |
| 3. | GENERALIZED PHYSIOGRAPHY OF THE INDIAN OCEAN                            | 23 |
| 4. | BOTTOM SEDIMENT CORE LOCATIONS  | 25 |

## FIGURES (CONT.)

|  |    |
|--|----|
| 5. WIDE ANGLE BOTTOM REFLECTION (WABR) STATIONS                      | 27 |
| 6. WIDE ANGLE BOTTOM REFLECTION (WABR) STATIONS<br>(SUB-AREAS A & B) | 29 |
| 7. OCEANOGRAPHIC STATION COMPOSITE                                   | 31 |
| 8. OCEANOGRAPHIC STATIONS, WINTER MONSOON (DEC-FEB)                  | 33 |
| 9. OCEANOGRAPHIC STATIONS, SPRING TRANSITION (MAR-APR)               | 35 |
| 10. OCEANOGRAPHIC STATIONS, SUMMER MONSOON (MAY-SEP)                 | 37 |
| 11. OCEANOGRAPHIC STATIONS, FALL TRANSITION (OCT-NOV)                | 39 |

## TABLES

|                                   |   |
|-----------------------------------|---|
| I. SURVEY DATES AND PORTS         | 3 |
| II. UNDERWAY STATION DATA SUMMARY | 6 |

## APPENDIXES

|   |     |
|---|-----|
| A. BOTTOM SEDIMENT CORE LOCATIONS                 | A-1 |
| B. WIDE ANGLE BOTTOM REFLECTION STATION LOCATIONS | B-1 |
| C. OCEANOGRAPHIC STATION LOCATIONS                | C-1 |

## I. BACKGROUND

Recent events have focused attention on the need for more detailed oceanographic and geological/geophysical information for the Indian Ocean to support fleet units assigned there. Requirements for environmental data originating at CINCPACFLT, COMINELWARCOM and the Defense Mapping Agency (DMA) were validated in 1973, 1974 and 1976 by the Oceanographer of the Navy (OCEANAV) and assigned to the Naval Oceanographic Office (NAVOCEANO) for fulfillment. Accordingly, NAVOCEANO assigned the USNS WILKES to the Indian Ocean in early 1977 for surveying which continued through 1979 when WILKES was recalled to CONUS for major yard maintenance. The WILKES surveys were generally conducted according to a two-year reconnaissance plan (ref. a) designed to provide data from major physiographic and oceanographic provinces and to form the framework for more detailed survey work in the future. These WILKES surveys represent NAVOCEANO's major shipboard survey effort in the Indian Ocean to date.

This report summarizes the portion of the WILKES' Indian Ocean data collection taken by the Ocean Projects Division (Code 7200). These data consist of the geological/geophysical and oceanographic measurements representing the bulk of data collected on 17 survey operations (31 survey legs). Data not summarized in this report include acoustic station data obtained by the Acoustic Projects Division (Code 7300) and a limited amount of underway gravity measurements (Code 8300). The positions of 6-hour synoptic expendable bathythermograph (XBT) observations are not tabulated nor are those of numerous additional XBTs taken during a Somali Current frontal study by the Tactical Analysis Division (Code 9100).



## II. INTRODUCTION

### A. SURVEY TRACKS

The USNS WILKES' Indian Ocean survey tracks are shown in figure 1 and the survey dates and ports are given in table I. Generalized bathymetry and physiography of the region are provided for convenient reference in figures 2 and 3. Each survey was assigned an operation number and each port-to-port period was designated by a specific leg number. Survey leg numbers essentially agree with those designated in the U. S. Naval Oceanographic Office Survey Plan for the Indian Ocean, 1977 - 1979 (ref. a). Variations from the original plan reflect changes in the emphasis of survey objectives or the impact of logistics requirements as well as the effect of ship or survey equipment casualties. There was no attempt to conduct originally planned survey legs in the numbered sequence of the original plan and additional survey leg number designations were added whenever a survey leg did not correspond to one originally planned.

### B. MEASUREMENTS

Data collected by the USNS WILKES is categorized as either underway or station data. Data collected routinely while underway, along the survey tracks shown in figure 1, includes narrow beam bathymetry (NBES), 3.5 kHz shallow subbottom profiles, seismic reflection profiles, total magnetic intensity and seasurface temperature. Station data includes sediment interval velocity measurements made by using wide angle bottom reflectivity (WABR) techniques, cores, sound velocity-salinity-temperature-depth measurements (SVSTD), and expendable

TABLE I. Survey Dates and Ports  
USNS WILKES Indian Ocean Surveys, April 1977 - December 1979

| OPERATION<br>NUMBER | LEG<br>NO. | DEPARTURE AND ARRIVAL DATES (JULIAN DAY) | PORTS                                  |
|---------------------|------------|--|--|
| 343719              | 1          | 11 Apr (101) - 30 Apr (120) 1977         | Mombasa, Kenya - Port Louis, Mauritius |
| 343719              | 2          | 9 May (129) - 28 May (148) 1977          | Port Louis - Port Louis                |
| 343728              | 3          | 3 Jun (154) - 25 Jun (176) 1977          | Port Louis - Mombasa                   |
| 343728              | 4          | 13 Jul (194) - 27 Jul (208) 1977         | Mombasa - Mombasa                      |
| 343728              | 5          | 30 Jul (211) - 5 Aug (217) 1977          | Mombasa - Victoria, Seychelles         |
|                     |            | 9 Aug (221) - 30 Aug (242) 1977          | Victoria - Port Louis                  |
| 343731              | 6          | 5 Sep (248) - 27 Sep (270) 1977          | Port Louis - Mombasa                   |
| 343731              | 7          | 7 Oct (280) - 20 Oct (293) 1977          | Mombasa - Diego Garcia                 |
|                     |            | 21 Oct (294) - 30 Oct (303) 1977         | Diego Garcia - Karachi, Pakistan       |
| 343802              | 8          | 5 Nov (309) - 27 Nov (331) 1977          | Karachi - Karachi                      |
| 343806              | 22         | 2 Dec (336) - 20 Dec (354) 1977          | Karachi - Singapore                    |
| 343811              | 18         | 4 Jan (004) - 29 Jan (029) 1978          | Singapore - Singapore                  |
| 343811              | 26         | 2 Feb (033) - 25 Feb (056) 1978          | Singapore - Singapore                  |
| 343815              | 17         | 7 Mar (066) - 25 Mar (084) 1978          | Singapore - Colombo, Sri Lanka         |
|                     |            | 25 Mar (084) - 27 Mar (086) 1978         | Colombo - Male, Maldives Republic      |
|                     |            | 29 Mar (088) - 31 Mar (090) 1978         | Male - Colombo                         |
| 343815              | 20         | 5 Apr (095) - 27 Apr (117) 1978          | Colombo - Singapore                    |
| 343821              | 27         | 26 Jun (177) - 13 Jul (194) 1978         | Singapore - Colombo                    |
| 343821              | 10         | 19 Jul (200) - 29 Jul (210) 1978         | Colombo - Karachi                      |
| 343821              | 9          | 3 Aug (215) - 24 Aug (236) 1978          | Karachi - Karachi                      |
| 343827              | 11         | 3 Sep (246) - 19 Sep (262) 1978          | Karachi - Colombo                      |
| 343827              | 12         | 24 Sep (267) - 28 Sep (271) 1978         | Colombo - Diego Garcia                 |
|                     |            | 30 Sep (273) - 17 Oct (290) 1978         | Diego Garcia - Colombo                 |
| 343828              | 15         | 23 Oct (296) - 11 Nov (315) 1978         | Colombo - Colombo                      |
| 343828              | 13         | 18 Nov (322) - 7 Dec (341) 1978          | Colombo - Singapore                    |
| 343901              | 14         | 8 Jan (008) - 29 Jan (029) 1979          | Singapore - Colombo                    |
| 343901              | 21         | 7 Feb (038) - 24 Feb (055) 1979          | Colombo - Colombo                      |

TABLE I. (Cont.) Survey Dates and Ports  
USNS WILKES Indian Ocean Surveys, April 1977 - December 1979

| OPERATION<br>NUMBER | LEG<br>NO. | DEPARTURE AND ARRIVAL DATES (JULIAN DAY) |                     | PORTS                       |
|---------------------|------------|--|---------------------|-----------------------------|
| 343907              | 23         | 22 Mar (081)                             | - 29 Mar (088) 1979 | Colombo - Victoria          |
| 343907              | 24         | 3 Apr (093)                              | - 27 Apr (117) 1979 | Victoria - Colombo          |
| 343908              | 16         | Part I                                   |                     |                             |
|                     |            | 6 May (126)                              | - 14 May (134) 1979 | Colombo - Diego Garcia      |
| 343908              |            | Hydrographic Survey                      |                     |                             |
|                     |            | 16 May (136)                             | - 1 Jun (152) 1979  | Diego Garcia - Diego Garcia |
| 343908              | 16         | Part II                                  |                     |                             |
|                     |            | 2 Jun (153)                              | - 6 Jun (157) 1979  | Diego Garcia - Colombo      |
| 343908              | 25         | 19 Jun (170)                             | - 20 Jun (171) 1979 | Colombo - Colombo           |
|                     |            | 30 Jun (181)                             | - 7 Jul (188) 1979  | Colombo - Singapore         |
| 343915              | 38         | 20 Jul (201)                             | - 5 Aug (217) 1979  | Singapore - Victoria        |
| 343916              | 29         | 16 Aug (228)                             | - 5 Sep (248) 1979  | Victoria - Victoria         |
| 343916              | 30         | 13 Sep (256)                             | - 3 Oct (276) 1979  | Victoria - Mombasa          |
| 343920              | 31         | 8 Oct (281)                              | - 29 Oct (302) 1979 | Mombasa - Victoria          |
| 343921              | 32         | 5 Nov (309)                              | - 24 Nov (328) 1979 | Victoria - Victoria         |
| 343921              | 33*        | 29 Nov (333)                             | - 17 Dec (351) 1979 | Victoria - Gulf of Aden     |

\* WILKES transited through Red Sea and Mediterranean to end Leg 33 at Augusta Bay, Sicily on 17 Dec (351), 1979.

bathymograph data. The amount and types of underway and station data are summarized in table II for each operation and leg number. The table is arranged by leg number sequence which is not the chronological sequence in which the data were obtained. Each type of measurement is treated individually in the subsequent sections of this report. Station location figures are presented for the core data, sediment interval velocity measurements (WABR), and oceanographic stations. Tables which provide station positions and other relevant information are cross-referenced to the figures and appear in the appendices.

### C. DATA ACQUISITION

The WILKES is equipped with the Oceanographic Data Acquisition System (ODAS) which consists of the computers and peripherals necessary for (1) collecting digital data on magnetic tape in real-time and for (2) post-processing these data aboard ship. The ODAS system was used for real-time underway data acquisition of bathymetry (NBES), total magnetic intensity and sea surface temperature. Although oceanographic station data were recorded digitally on a separate data logger, both underway and oceanographic station data were processed on the ODAS computers.

1. Underway Data - During ODAS processing, underway data are edited and emended to remove spikes and to correct errors. The digital data files were supplemented with independently compiled information obtained from analog records using a table digitizer whenever it was necessary to fill ODAS acquisition data gaps or to replace unacceptable digital acquisition data. The underway acquisition data were acquired at a 10-second sample rate but after processing represents average values for every minute of data collection time. These 1-minute average

TABLE II. Underway and Station Data Summary  
USNS WILKES Indian Ocean Surveys, April 1977 - December 1979

| LEG<br>NO. | OPERATION<br>NUMBER | UNDERWAY DATA (nautical miles) |         |         |          | STATION DATA (no. of stations) |      |       |     |       |
|------------|---------------------|--------------------------------|---------|---------|----------|--------------------------------|------|-------|-----|-------|
|            |                     | NBS                            | 3.5 kHz | Seismic | Magnetic | Sea Temp.                      | WABR | Cores | XBT | SVSTD |
| 1          | 343719              | 2780                           | 2680    | 2375    | 2270     | 2780                           | 0    | 8     | 35  | 12    |
| 2          | 343719              | 2900                           | 2885    | 2550    | 2655     | 2900                           | 0    | 8     | 25  | 11    |
| 3          | 343728              | 2975                           | 2975    | 2935    | 2935     | 2975                           | 6    | 8     | 26  | 11    |
| 4          | 343728              | 1815                           | 1535    | 1780    | 1425     | 1815                           | 4    | 6     | 103 | 8     |
| 5          | 343728              | 4090                           | 4090    | 3760    | 3760     | 4090                           | 0    | 7     | 20  | 12    |
| 6          | 343731              | 3900                           | 3900    | 3800    | 3800     | 3900                           | 12   | 8     | 81  | 13    |
| 7          | 343731              | 4270                           | 4270    | 4000    | 4000     | 4270                           | 8    | 5     | 82  | 8     |
| 8          | 343802              | 2905                           | 2905    | 2905    | 2905     | 2905                           | 5    | 12    | 72  | 25    |
| 9          | 343821              | 3216                           | 1337    | 3074    | 3094     | 3216                           | 3    | 4     | 372 | 0     |
| 10         | 343821              | 1412                           | 1412    | 1371    | 1390     | 1412                           | 0    | 6     | 31  | 12    |
| 11         | 343827              | 2698                           | 0       | 2596    | 2596     | 2659                           | 0    | 6     | 33  | 11    |
| 12         | 343827              | 3813                           | 0       | 3573    | 3573     | 3742                           | 1    | 3     | 169 | 6     |
| 13         | 343828              | 3708                           | 0       | 2751    | 2737     | 3708                           | 7    | 6     | 59  | 8     |
| 14         | 343901              | 3601                           | 3601    | 3601    | 3380     | 3380                           | 10   | 7     | 73  | 10    |
| 15         | 343828              | 3115                           | 0       | 3087    | 3122     | 3141                           | 8    | 8     | 66  | 11    |
| 16         | 343908              | 2441                           | 2438    | 2322    | 918      | 2432                           | 3    | 2     | 234 | 5     |
| *          | 343908              | 1136                           | 1136    | 0       | 0        | 1136                           | 0    | 0     | 64  | 20    |
| 17         | 343815              | 3319                           | 3319    | 2898    | 3289     | 3319                           | 10   | 6     | 64  | 10    |
| 18         | 343811              | 2450                           | 3023    | 1996    | 2023     | 3023                           | 7    | 10    | 51  | 11    |
| 19         | (No Survey Leg 19)  |                                |         |         |          |                                |      |       |     |       |
| 20         | 343815              | 3122                           | 2932    | 2920    | 2932     | 3122                           | 2    | 7     | 94  | 14    |
| 21         | 343901              | 2744                           | 2744    | 2744    | 2703     | 2703                           | 4    | 4     | 62  | 9     |
| 22         | 343806              | 3460                           | 3460    | 3300    | 3300     | 3460                           | 11   | 11    | 53  | 11    |
| 23         | 343907              | 1572                           | 1495    | 1191    | 1188     | 1568                           | 0    | 0     | 22  | 0     |
| 24         | 343907              | 3467                           | 3596    | 3132    | 2947     | 3463                           | 2    | 0     | 53  | 40**  |
| 25         | 343908              | 1599                           | 1599    | 1063    | 1546     | 1885                           | 1    | 0     | 25  | 0     |
| 26         | 343811              | 2727                           | 2652    | 2589    | 2494     | 2727                           | 4    | 6     | 34  | 13    |
| 27         | 343821              | 2569                           | 2228    | 2164    | 2212     | 2627                           | 0    | 5     | 60  | 10    |
| 28         | (No Survey Leg 28)  |                                |         |         |          |                                |      |       |     |       |

TABLE II. (Cont.) Underway and Station Data Summary  
USNS WILKES Indian Ocean Surveys, April 1977 - December 1979

| LEG<br>NO.                           | OPERATION<br>NUMBER | UNDERWAY DATA (nautical miles) |         |         |          | STATION DATA (no. of stations) |      |       |           |
|--------------------------------------|---------------------|--------------------------------|---------|---------|----------|--------------------------------|------|-------|-----------|
|                                      |                     | NBES                           | 3.5 kHz | Seismic | Magnetic | Sea Temp.                      | WABR | Cores | XBT SVSTD |
| 29                                   | 343916              | 3810                           | 3810    | 0       | 18       | 3798                           | 0    | 0     | 407 27    |
| 30                                   | 343916              | 2964                           | 2644    | 2881    | 2907     | 2961                           | 37   | 7     | 260 10    |
| 31                                   | 343920              | 3655                           | 3544    | 3627    | 3307     | 3653                           | 23   | 7     | 141 11    |
| 32                                   | 343921              | 3098                           | 3010    | 3024    | 3013     | 3099                           | 13   | 9     | 174 12    |
| 33***                                | 343921              | 1753                           | 1707    | 544     | 1250     | 1753                           | 3    | 0     | 30 0      |
| 34-37 (No Survey Legs 34 through 37) |                     |                                |         |         |          |                                |      |       |           |
| 38                                   | 343915              | 2568                           | 2495    | 2068    | 2050     | 2570                           | 15   | 0     | 56 0      |
| TOTALS                               |                     | 95652                          | 79456   | 82621   | 81739    | 96192                          | 199  | 176   | 3131 361  |

\* Leg 16 was interrupted for a hydrographic survey near Diego Garcia which is tabulated separately here.

\*\* CTD (Conductivity, Temperature, Depth) stations were collected on Leg 24 in lieu of the standard SVSTD station measurements.

\*\*\* Leg 33 began at the Seychelles and ended at Augusta Bay, Sicily. Only mileages and stations collected in the Indian Ocean (including the Gulf of Aden) are included here.

#### ABBREVIATIONS:

NBES.....Narrow Beam Echo Sounder  
3.5 kHz.....Shallow Subbottom Profiler  
Seismic.....Sparker Seismic Reflection Profiler  
Magnetic.....Total Magnetic Intensity  
WABR.....Wide Angle Bottom Reflectivity (Sediment Interval Velocity Measurements)  
Sea Temp.....Continuous Sea Surface Temperature  
XBT.....Expendable Bathythermograph  
SVSTD.....Sound Velocity, Salinity, Temperature, Depth System.

data were merged with digital smoothed navigation and stored on magnetic tape. Prior to merge, navigation on punched cards were ODAS processed to obtain 1-minute positions based on straight line interpolation between accepted navigation fixes. From the underway merged data tapes, various plots, profiles and listings were made for final digital data verification and for reference during conduct of the surveys.

Besides ODAS real time digital data acquisition, all underway data were collected in analog chart form. Analog records of bathymetry, total magnetic intensity and sea surface temperature were used to verify ODAS data during shipboard processing and were saved as hard copy backup for the final data on magnetic tape. Analog records only were collected showing 3.5 kHz profiles and seismic-reflection profiles. Wide angle bottom reflection (WABR) data for sediment interval velocity determination were collected only in analog form on the seismic recorders until Leg 30 when these data were also recorded on magnetic tape.

2. Oceanographic Station Data - ODAS processing of oceanographic station data paralleled the procedures for underway data. The measured sensor values of sound velocity, salinity, temperature and depth (pressure), which were recorded at a 0.5-second sample rate on a digital data logger, were processed to obtain average values for each 1-meter depth increment. From these, computed values of sound velocity were determined as were values of sigma-t, specific volume anomaly and true depth. A detailed history was maintained on the performance of the SVSTD sensors in order to maintain operation within accepted specifications. To facilitate this, a Rosette water sampler with both protected and unprotected reversing thermometers was used to collect samples at selected

depths at nearly every station. Salinity, temperature and depth values determined from these samples were used for comparison with the electronic sensors values. Calibration and field-derived corrections, if necessary, were applied during the course of ODAS processing. From final digital data tapes, listings, plots and profiles were made aboard ship for each station. XBT data were all collected as graphic analog records.

#### D. NAVIGATION

The Navy's transit navigation satellite system was used exclusively for positioning control on WILKES during the Indian Ocean surveys because there was no loran coverage in the area and the Omega navigation network was inadequately developed for survey positioning accuracy. WILKES was outfitted with two Magnavox 706 model satellite receivers which were simultaneously used to monitor the 4 to 5 satellites then in operation. The one exception to this occurred during the last 9 days of Leg 29 (from 1600Z 28 Aug 1980) when both satellite receivers were inoperable. Navigation was then by celestial and dead reckoning (DR).

Because of the equatorial location of the Indian Ocean survey area and the N-S orbits of the satellites it was not unusual to experience one or two 4 to 5-hour periods each day when good fixes were unobtainable. Usually 14 to 16 acceptable satellite fixes were recorded in a 24-hour period and from these the DR positions were computed for intervening course and speed changes and station locations. The rather long straight reconnaissance tracks minimized the number of maneuvers between fixes so that it is reasonable to assume that the average position accuracy is within 900 meters although errors up to a few kilometers possibly exist under worst case conditions.



### III. UNDERWAY DATA

#### A. SEISMIC-REFLECTION PROFILES

Continuous profiles showing deep penetration into the sediment section of the ocean bottom were collected routinely along almost all survey track lines except for leg 29 and leg 33 (fig. 1, table II). Penetration of the sediment section to acoustic basement was usually observed when sediment thickness was less than 2 seconds (two-way travel time). In thicker sediments, deep reflectors down to 2.5 seconds of penetration were often observed.

Seismic-reflection profiles were collected at ship speeds generally between 8 and 10 knots using a Teledyne SSP (seismic subbottom profile) system. Most of the seismic profiles were collected using 60 kJ (kilojoules) of electrical energy output for the spark discharge from two electrode pairs towed approximately 60 m aft of the ship. A 90 kJ output was sometimes used in areas of thick sediment cover.

A single hydrophone streamer, to receive the bottom and subbottom reflected signals, was towed with its trailing end approximately 240 m astern of the ship; only the outermost 60 m contained the active section which consists of 100 piezoelectric pressure sensing hydrophone elements. Output from the hydrophone streamer elements were combined into a single channel, then amplified, filtered and conditioned for input to facsimile recorders. Typical low and high cut filter settings were 40 and 125 Hz, respectively. The hydrophone streamer was usually towed at depths varying between 6 and 9 meters depending on the influence of ship's speed and heading under various sea conditions.

Seismic-reflection profiles were collected only in analog record form using Raytheon facsimile recorders (Model PSR-1910 through December 1978 and LSR-1811 thereafter). The primary records were collected using a 10-second sweep rate. Simultaneously, on a slave recorder in delayed sweep stop-start mode, 4-second sweep recordings were also obtained in order to provide expanded detail.

#### B. 3.5 kHz SHALLOW SUBBOTTOM PROFILES

An Edo Model 240 Bottom Reflectivity System was used for continuous profiling of the sedimentary layers just below the water-sediment interface. This 3.5 kHz shallow subbottom profiling system used a signal output of about 120 dB (30° conical beam width) transmitted at a 1-second repetition rate and having a 2 ms pulse width. Full chart scale on the resulting records is 750 meters. All records are scaled in meters representing uncorrected depths based on a nominal sound velocity in sea water of 1500 m/s. The penetration observed on the 3.5 kHz shallow subbottom profiles from the Indian Ocean commonly ranged from none to about 50 meters below the sediment water interface depending on bottom sediment characteristics.

Although 3.5 shallow subbottom profiles were routinely collected when underway (fig. 1, table II), partial data were collected on leg 9 and no data were obtained on legs 11, 12, 13, 15. The 3.5 kHz transducer was damaged on leg 17, finally failed on leg 9 and was not repaired until drydocking after leg 13.

### C. TOTAL MAGNETIC INTENSITY

Measurements of the earth's total magnetic field intensity, expressed in gammas, were recorded on WILKES using a Geometrics Model G 801 Marine Proton Magnetometer towed approximately 250 meters behind the ship. The magnetometer system is designed to have an accuracy of  $\pm 0.5$  gamma.

Analog chart recordings (6-second sample rate) were made using a full chart scale of 100 gammas. Digital data in final ODAS merged format provide position and 1-minute values on magnetic tape. The final ODAS data also contain residual magnetic field data computed using the International Geomagnetic Reference Field (IGRF) of 1965. There was no attempt to correct for diurnal variations. Total magnetic field data were collected on almost all Indian Ocean survey tracks (fig. 1, table II) except for the Colombo to Diego Garcia portion of leg 16, and leg 29 because of interference of the towed sensor with extensive XBT collection on that survey.

### D. BATHYMETRY

Bathymetric soundings were recorded along all survey tracks (fig. 1, table II) using a Harris Model 853D Narrow Beam Echo Sounder (NBES) manufactured by General Instruments Corp. This elaborate system has a crossed configuration of separate multiple element projector and receiver arrays designed to produce a beam pattern having a beam angle of  $2\frac{2}{3}$  degrees. The acoustic signal is transmitted for 7 ms at 4 kw on a frequency of 12 kHz. Pitch and roll stabilization for the NBES system is provided electronically using the ship's Mark 19 gyrocompass

for stable reference. The sounding accuracy of this system is considered to be + 2 meters at a water depth of 7500 meters.

#### E. SEA SURFACE TEMPERATURE

Sea surface temperature (SST) was recorded continuously while underway along all survey tracks (fig. 1, table II) using a Hewlett-Packard Model 2801A quartz crystal thermometer with the probe mounted through the ship's hull about 60 centimeters below the water line. The water temperature was measured to the nearest hundredth of a degree Celsius and digitally sampled every 10 seconds by the ODAS computer.

#### IV. STATION DATA

##### A. BOTTOM SEDIMENT CORES

Linered cores were obtained using a 900 kg modified Ewing corer which was generally equipped with a 6-meter core barrel. All cores were collected as gravity cores, i.e., neither piston nor tripping arm was used. Recovered cores were sectioned into lengths not exceeding 1.5 meters and stored in the scientific chill box until shipboard analyses were performed. Shipboard analyses consisted of taking radiographs, making visual descriptions and measuring transverse sediment sound velocity through the linered core. Cores were then longitudinally sectioned and vane shear measurements made at pre-selected intervals based on radiograph and visual inspections. Samples of the core were returned to NAVOCEANO for analyses of engineering properties. Samples of all cores are retained in the NAVOCEANO core repository.

The location of cores taken from WILKES are shown in figure 4 and listed in Appendix A which also provides information about the amount of core recovery, the water depth and the physiographic province in which each core is located. Cores are numbered to indicate leg number and the sequential core number on a specific leg (Core 2-04 is the fourth core taken on leg 2). All sequence numbers are accounted for even though no core, or no recovery was obtained in some cases. In a few instances core attempts were made but because of no recovery they were not assigned a core number. In some of these instances useful information was obtained, and these core attempts have been inserted in the listing with a sequence number '00'. For example, no recovery was made at core

location 6-00, but the fact that some coral chips were retrieved and the core cutter was dented is considered significant information.

Wherever possible the WILKES' survey tracks were designed to cross the Deep Sea Drilling Project (DSDP) core locations and to collect cores at these locations for comparative purposes. The DSDP locations are shown in figure 4 and the proximity of the WILKES' cores to them are given in the remarks column of Appendix A.

#### B. WIDE ANGLE BOTTOM REFLECTION (WABR) STATIONS

Sediment interval velocity measurements were obtained using wide angle bottom reflectivity techniques (WABR). The objective of the measurements is to obtain travel time information within the sedimentary layers so that average compressional wave velocities can be computed for each of the sediment intervals. Average compressional wave velocities are required to compute true sedimentary thicknesses and to generate velocity-depth functions for geoacoustic modeling. The measurements are made by a special adaptation of the seismic-reflection profile system, using the sparker as an acoustic source and sonobuoys as acoustic receivers (ref. b).

The locations of the WABR stations are shown in figures 5 and 6. Stations which have been reported in reference b are identified. Additional stations have been reported in reference c. Not all of the unreported stations will be processable as the required environmental conditions for useful data are not always met. For the data to be acceptable the ocean bottom must consist of horizontally layered sediment. Appendix B lists the WABR station number, cruise number, position, Julian date and physiographic province for each station. The WABR station number consists of the survey leg number and a serialized identifier.

### C. OCEANOGRAPHIC STATIONS

Oceanographic measurements were obtained on all survey legs and the station locations are shown on figure 7. Figures 8 through 11 show the seasonal distribution of the stations for the winter monsoon, summer monsoon and transition periods. In these figures the SVSTD stations are identified as being either shallow or deep. Shallow stations were usually made to 2500 meters, and deep stations are those where data were collected to within 100 meters of the ocean bottom.

On all survey legs, except for leg 24, the oceanographic station data were collected using a Bissett-Berman (Plessey) Model 9040 SVSTD system to which a General Oceanics Rosette Multi-Bottle Array was mounted for taking water samples. The accuracies of this system are: temperature,  $\pm 0.02^{\circ}\text{C}$ ; salinity,  $\pm 0.02\%$ ; depth,  $\pm 0.25\%$ ; and computed sound velocity (corrected for in situ density),  $\pm 0.3$  m/s. On leg 24, all oceanographic station data were collected using a conductivity, temperature, depth (CTD) system provided by Woods Hole Oceanographic Institute (WHOI). The CTD stations were all deep measurements and the data from them will be available to NAVOCEANO when processing has been completed by WHOI.

Appendix C lists the stations by cruise, leg and station number; and also contains the geographic position and the depth to which data were obtained. The "corrected cast depth" is the computed sensor depth corrected for actual in situ density, whereas, "corrected sonic depth" is the bottom depth derived by applying Matthews' table corrections to the uncorrected bathymetric depth at the station (discrepancies are expected between these two values).

#### D. EXPENDABLE BATHYTHERMOGRAPHS (XBTs)

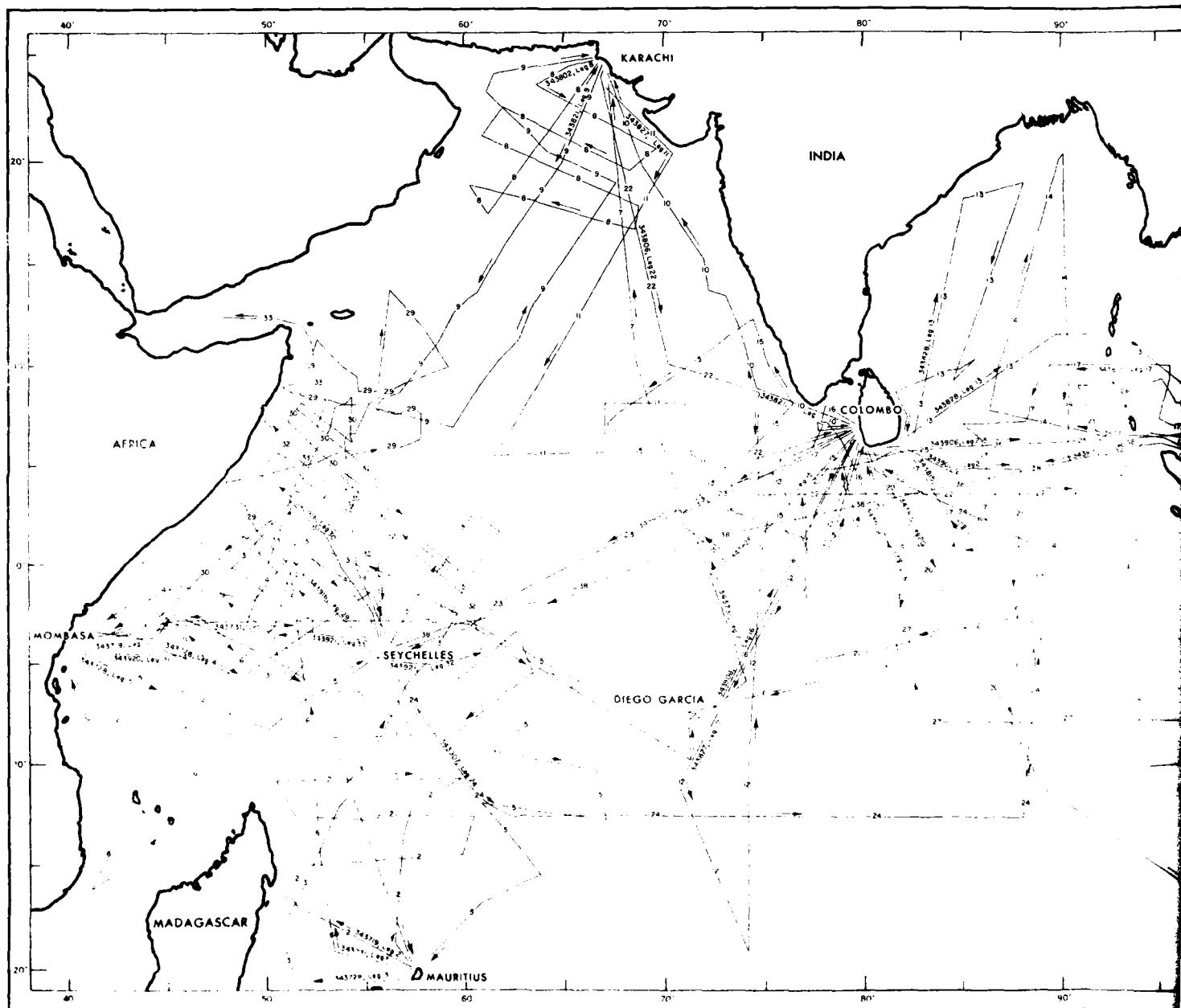
In compliance with the requirement to transmit temperature-depth data to Fleet Numerical Oceanography Central, Monterey, WILKES collected expendable bathythermograph data at 6-hour intervals whenever the ship was underway. On survey legs 29, 30 and 31, many additional XBTs were taken in conjunction with studies of the Somali current. If the positions of the 3,131 XBT stations were to be plotted, the resulting plot would be identical to the survey track shown in figure 1.

The XBT data were collected in analog chart form using a Sippican Mark 2A recorder and either XBT T-7 probes (750-meter depth range) or T-4 probes (450-meter depth range).

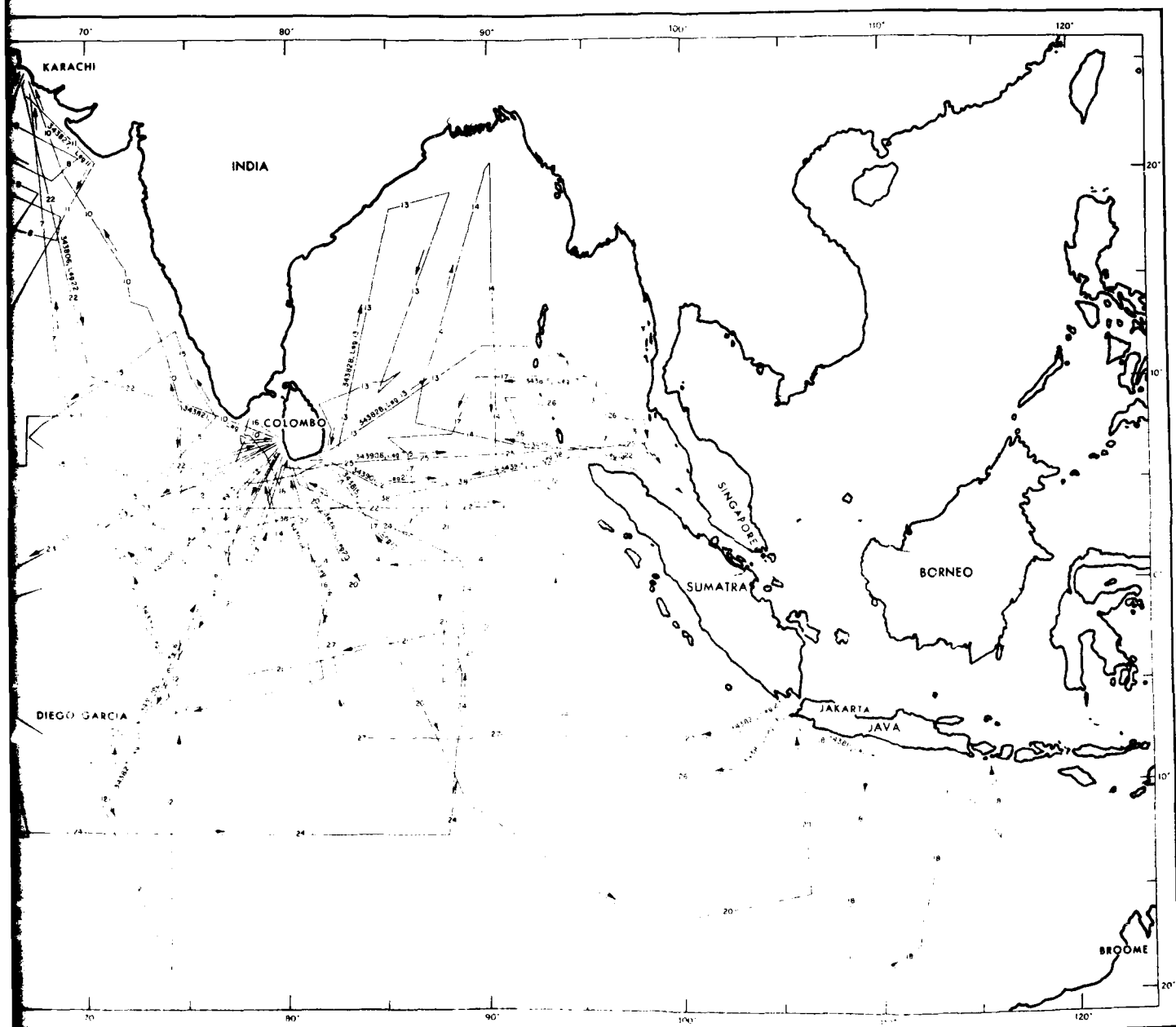


#### REFERENCES

- a. NAVOCEANO unpublished Confidential report, U. S. Naval Oceanographic Office Survey Plan for the Indian Ocean, 1977-1979 (U).
- b. NAVOCEANO Technical Note TN 3432-02-78, Sediment Interval Velocity Measurement From the USNS WILKES Surveys in the Indian Ocean, 1977-1978, December 1978.
- c. NAVOCEANO Technical Note TN 7220-01-80, Sediment Interval Velocity Measurements in the Indian Ocean (Stations 24-37), June 1980.

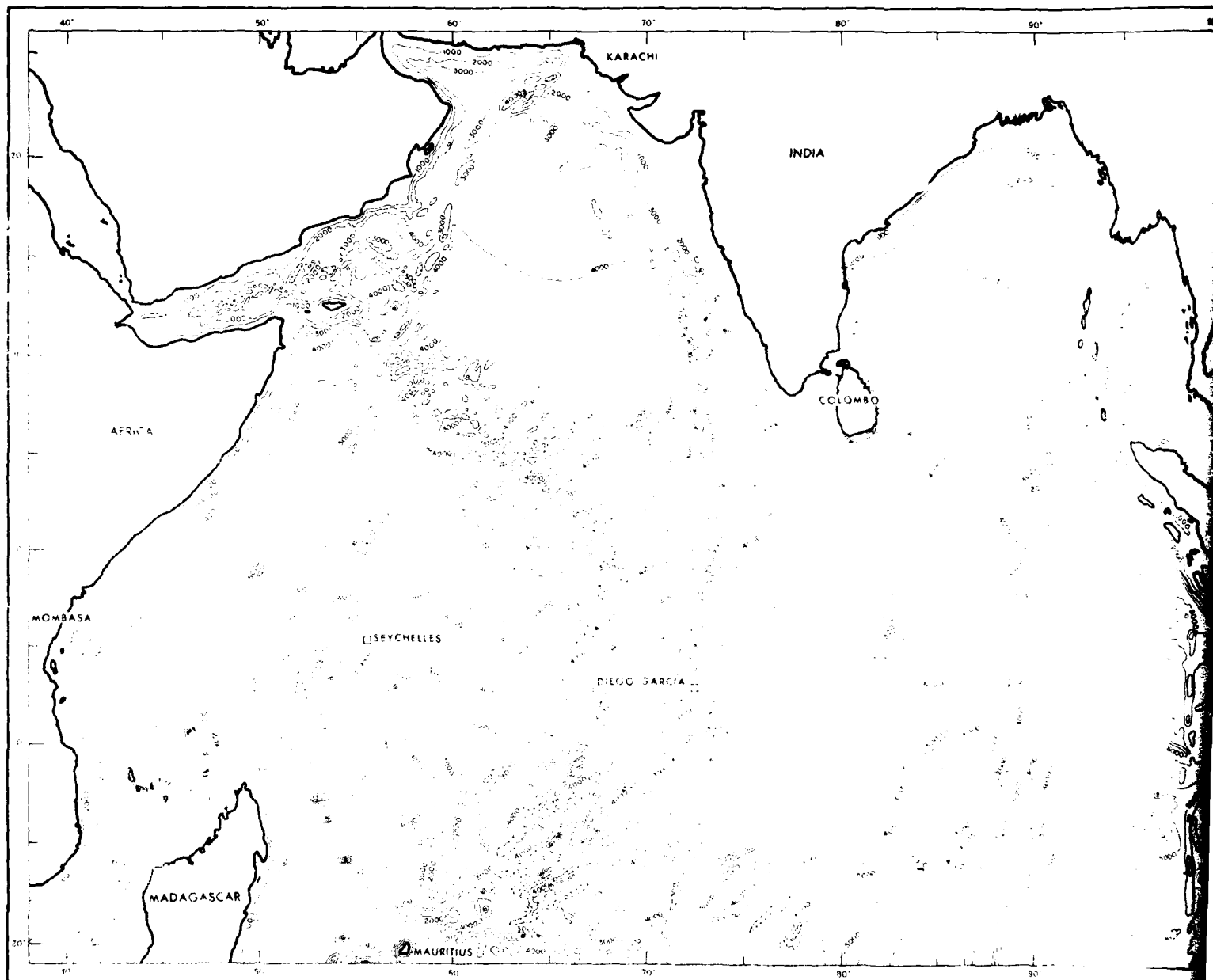


**FIGURE 1 INDIAN OCEAN SURVEY TRACKS, USNS WILKES—APRIL 1977**  
 Survey operation numbers are shown with arrows indicating direction of ship track. Track is designated by an Indian Ocean survey leg number. A survey operation consists of 3 survey legs.

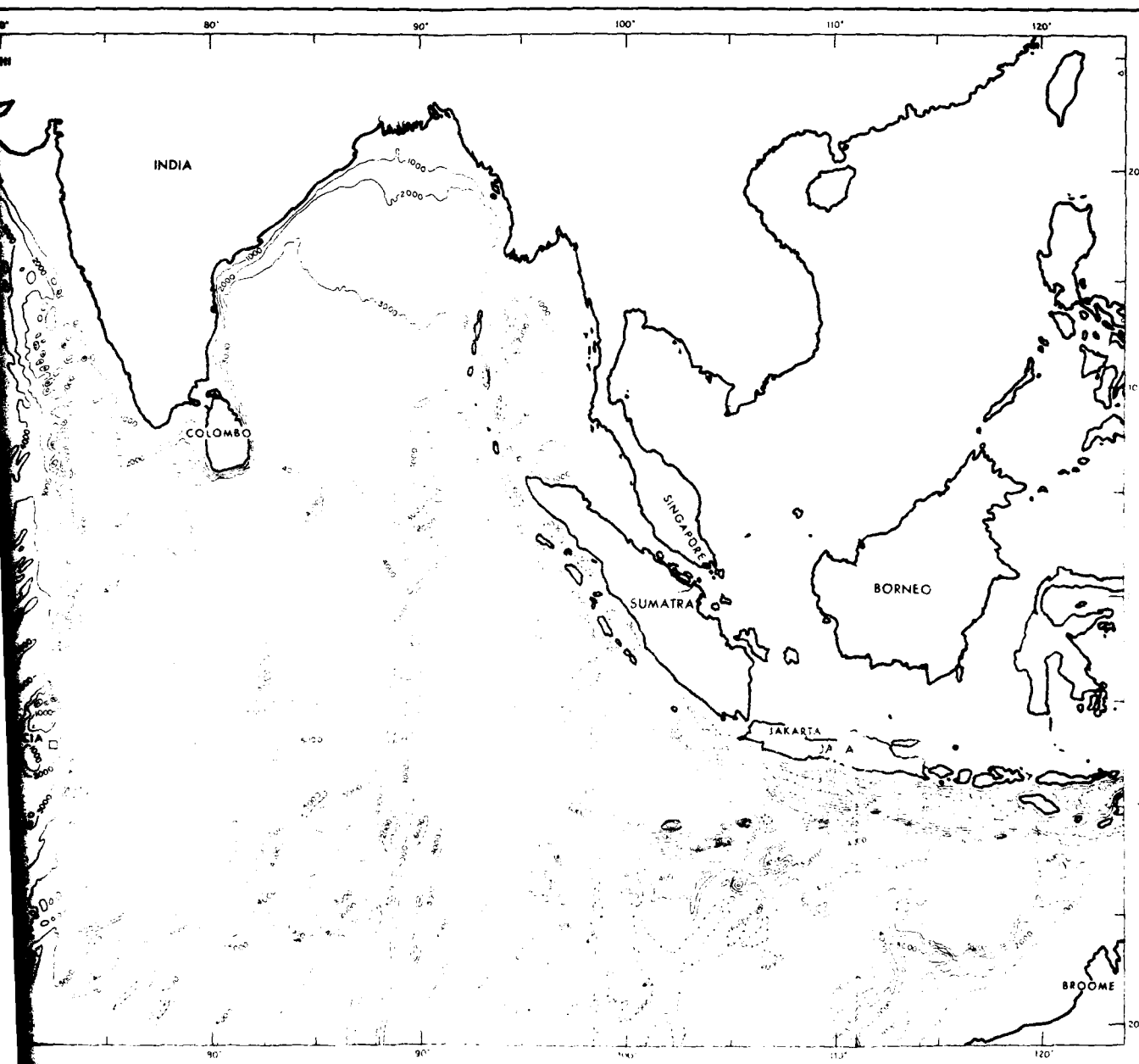


# **INDIAN OCEAN SURVEY TRACKS, USNS WILKES—APRIL 1977-DECEMBER 1979**

Numbers are shown with arrows indicating direction of ship travel. Each port-to-port track is identified by an Indian Ocean survey leg number. A survey operation may include from 1 to



**FIGURE 2 GENERALIZED INDIAN OCEAN BATHYMETRY**  
Contour interval = 1000 meters (1500 m/sec uncorrected)



# **GENERALIZED INDIAN OCEAN BATHYMETRY**

Contour interval = 1000 meters (1500 m/sec uncorrected)

*n*

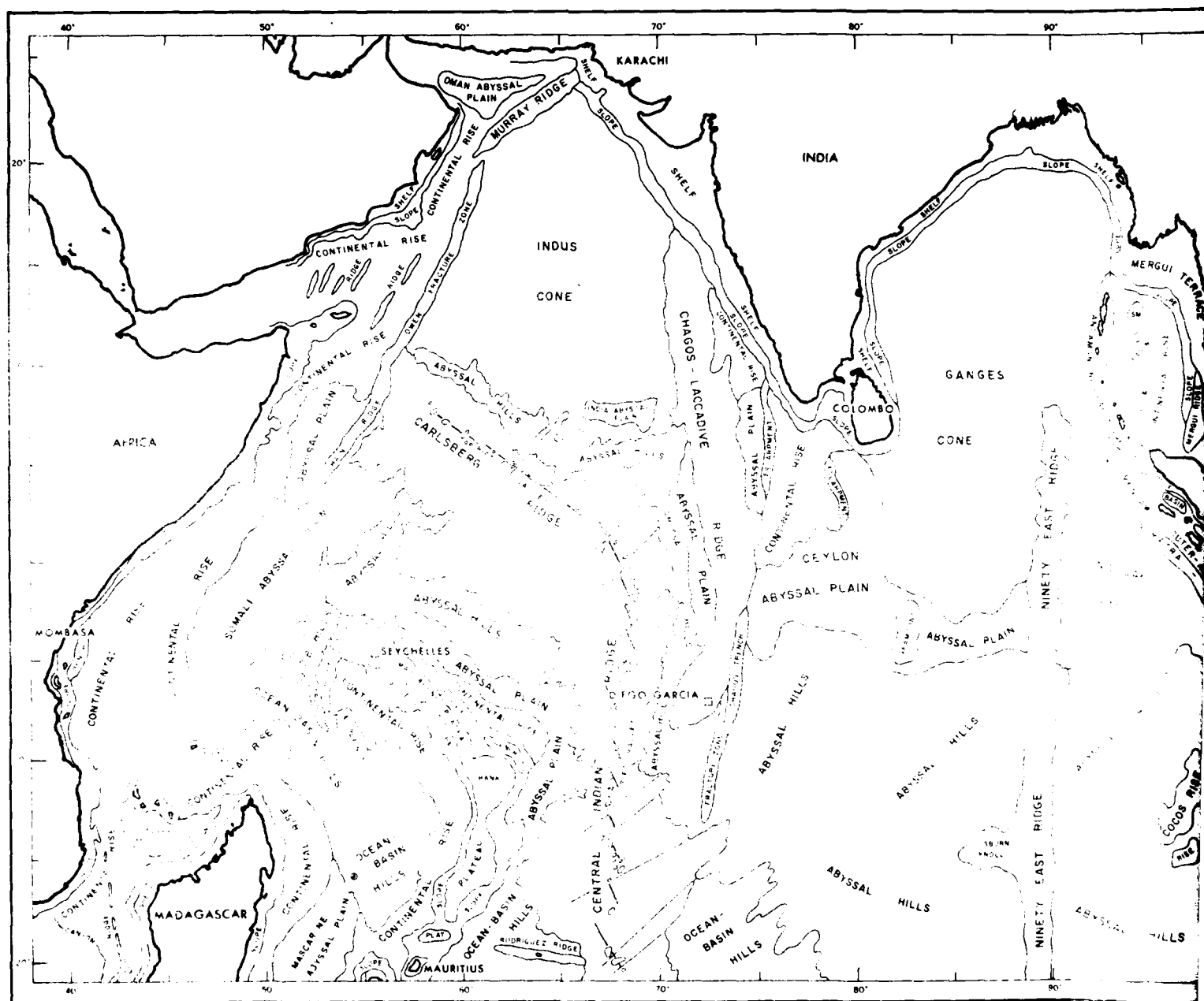
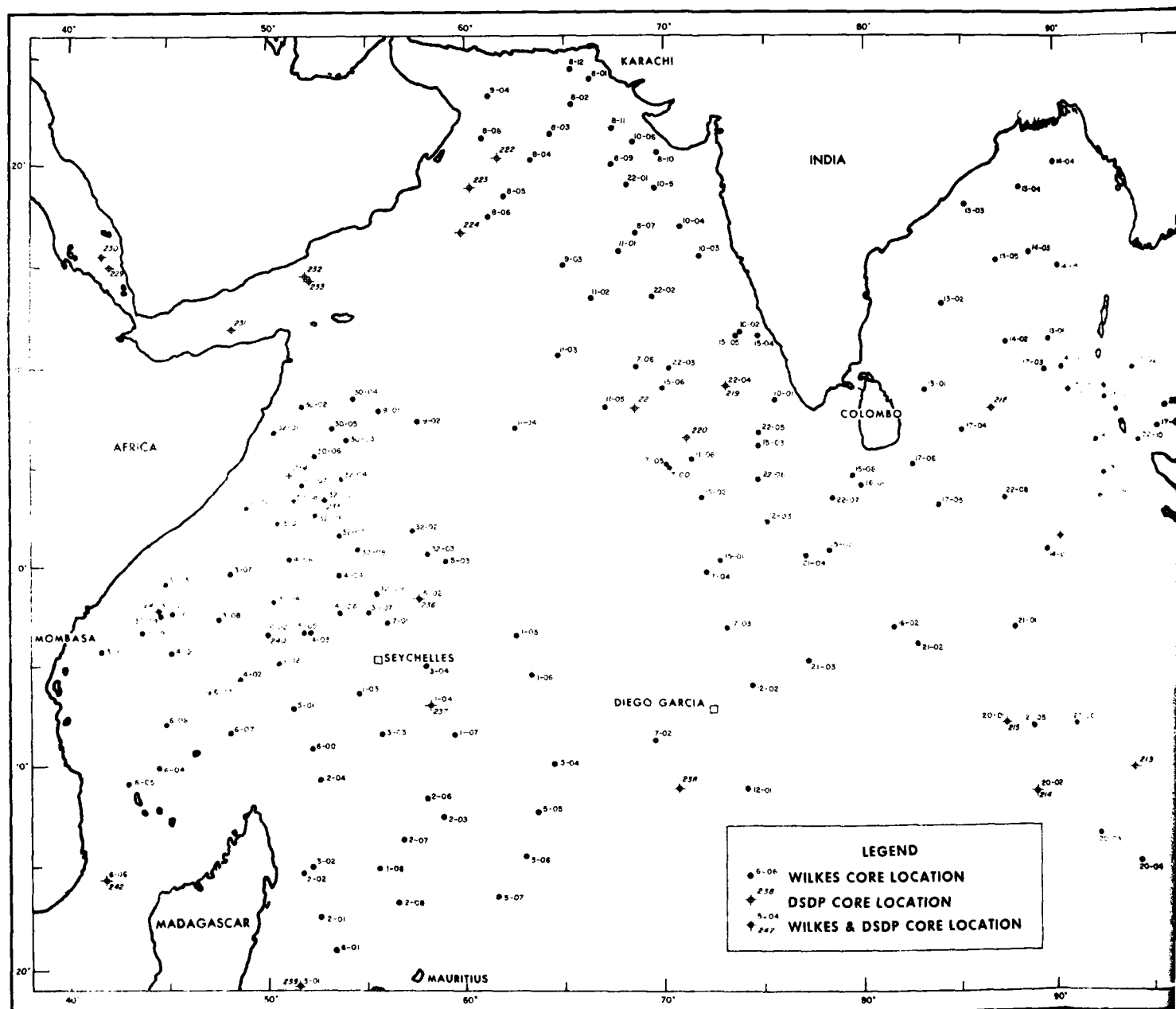


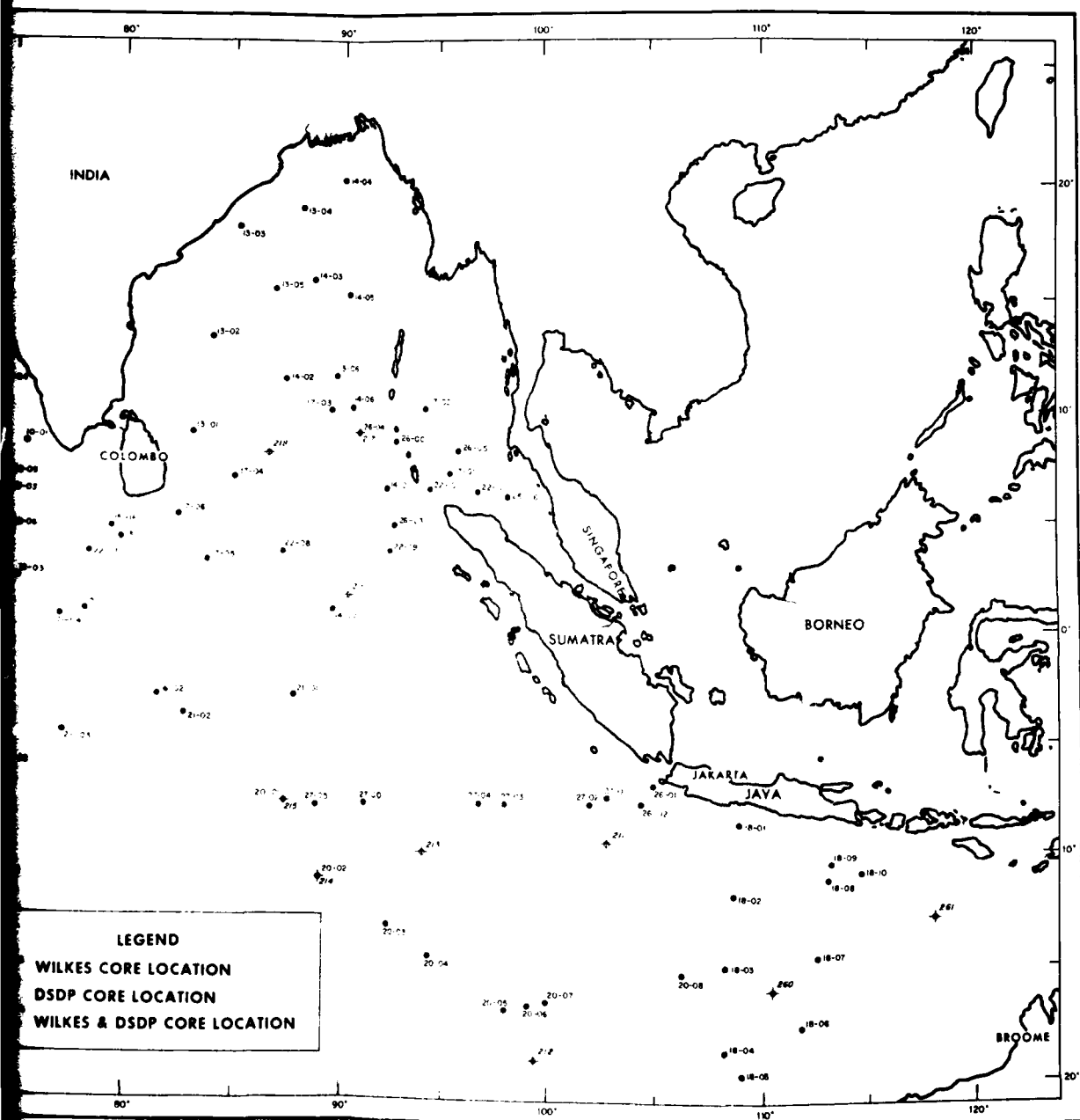
FIGURE 3 GENERALIZED PHYSIOGRAPHY OF THE INDIAN O



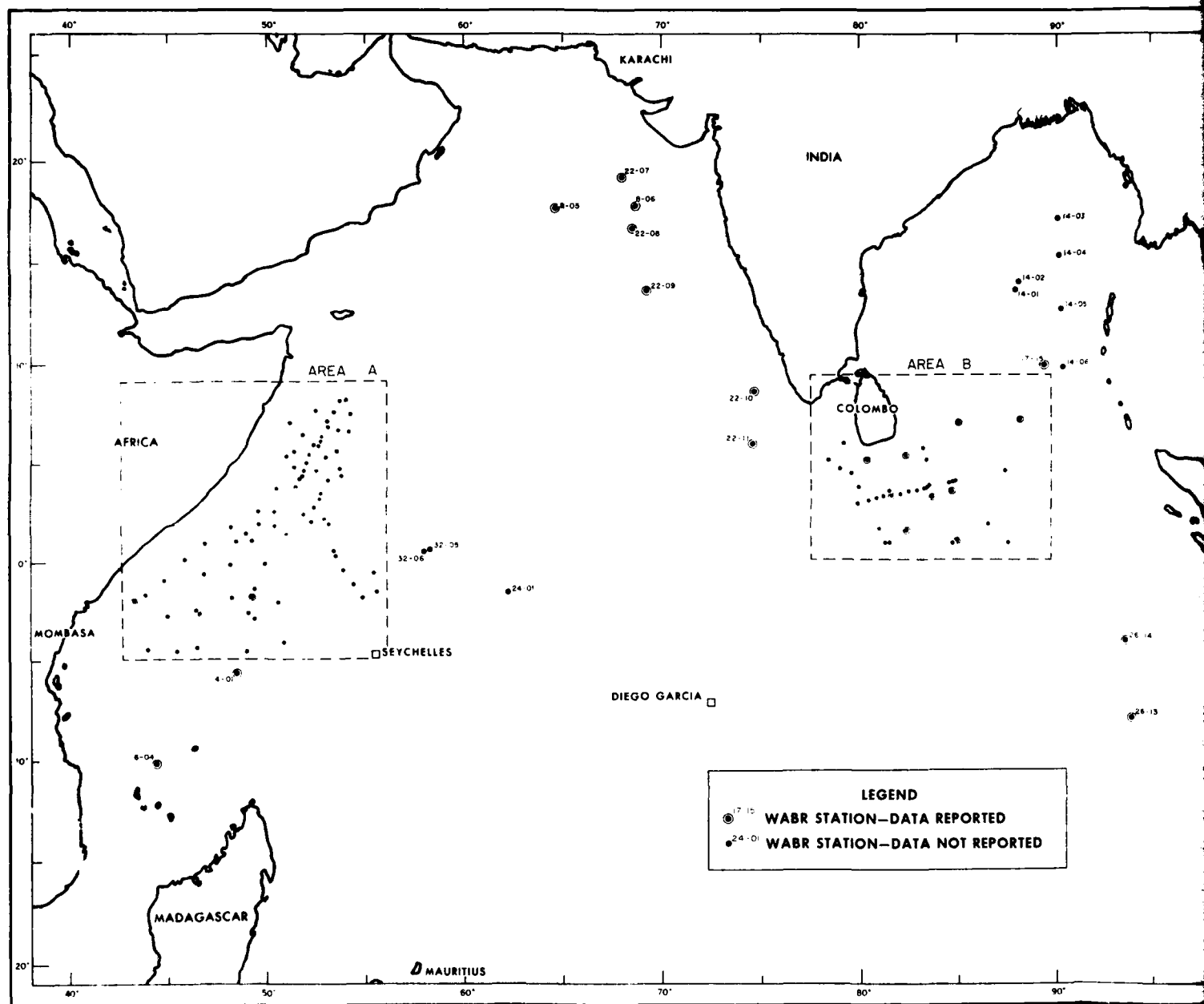


**FIGURE 4 BOTTOM SEDIMENT CORE LOCATIONS, USNS WILKES INDIAN OCEAN SURVEY**  
Core locations are keyed to WILKES survey leg numbers; e.g., core location 6-06 is leg 6, core 6. DSDP locations are shown for reference.

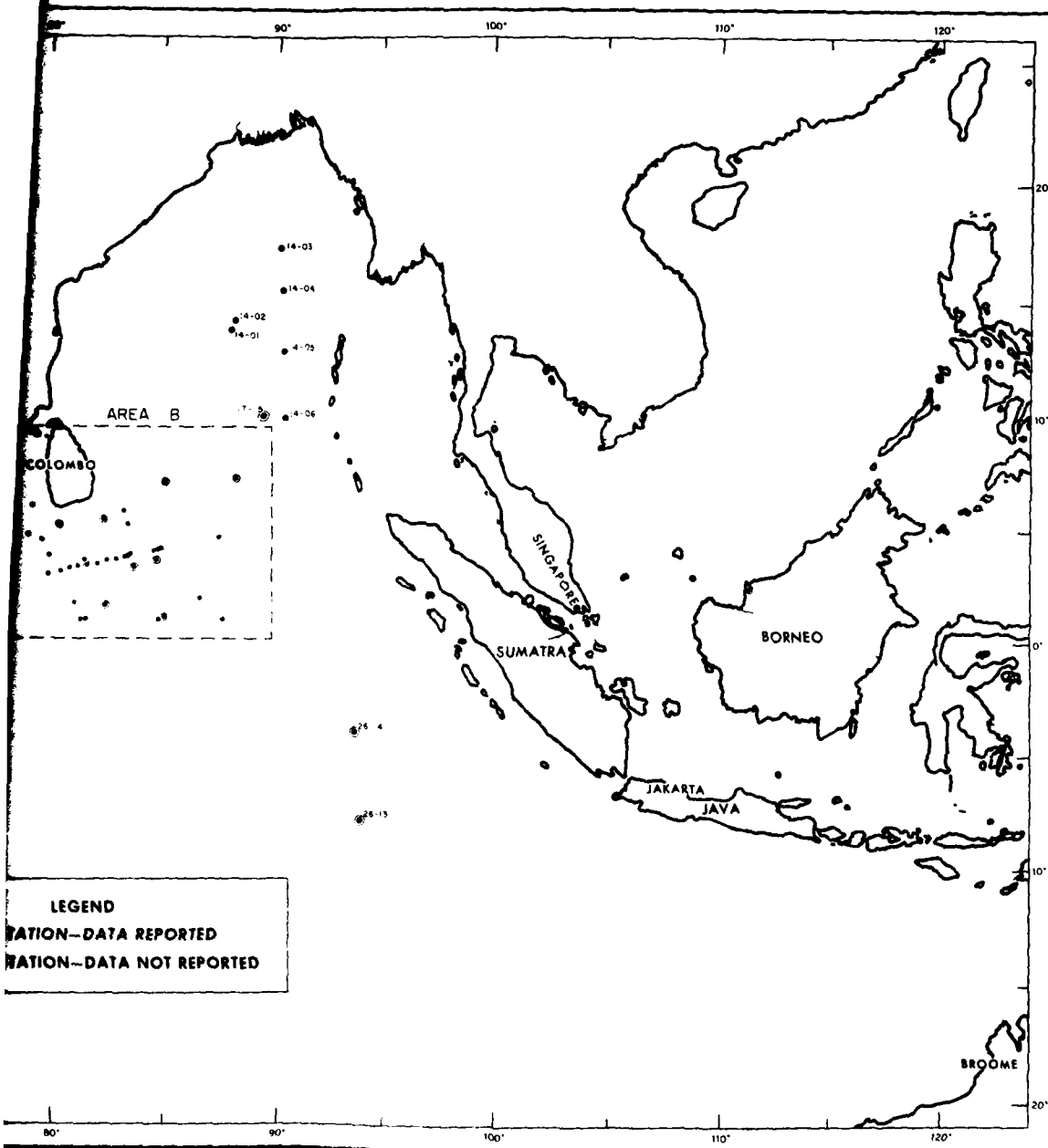




**USNS WILKES INDIAN OCEAN SURVEYS—APRIL 1977-DECEMBER 1979**  
 e.g., core location 6-06 is leg 6, core 6. Deep Sea Drilling Project (DSDP) core locations are



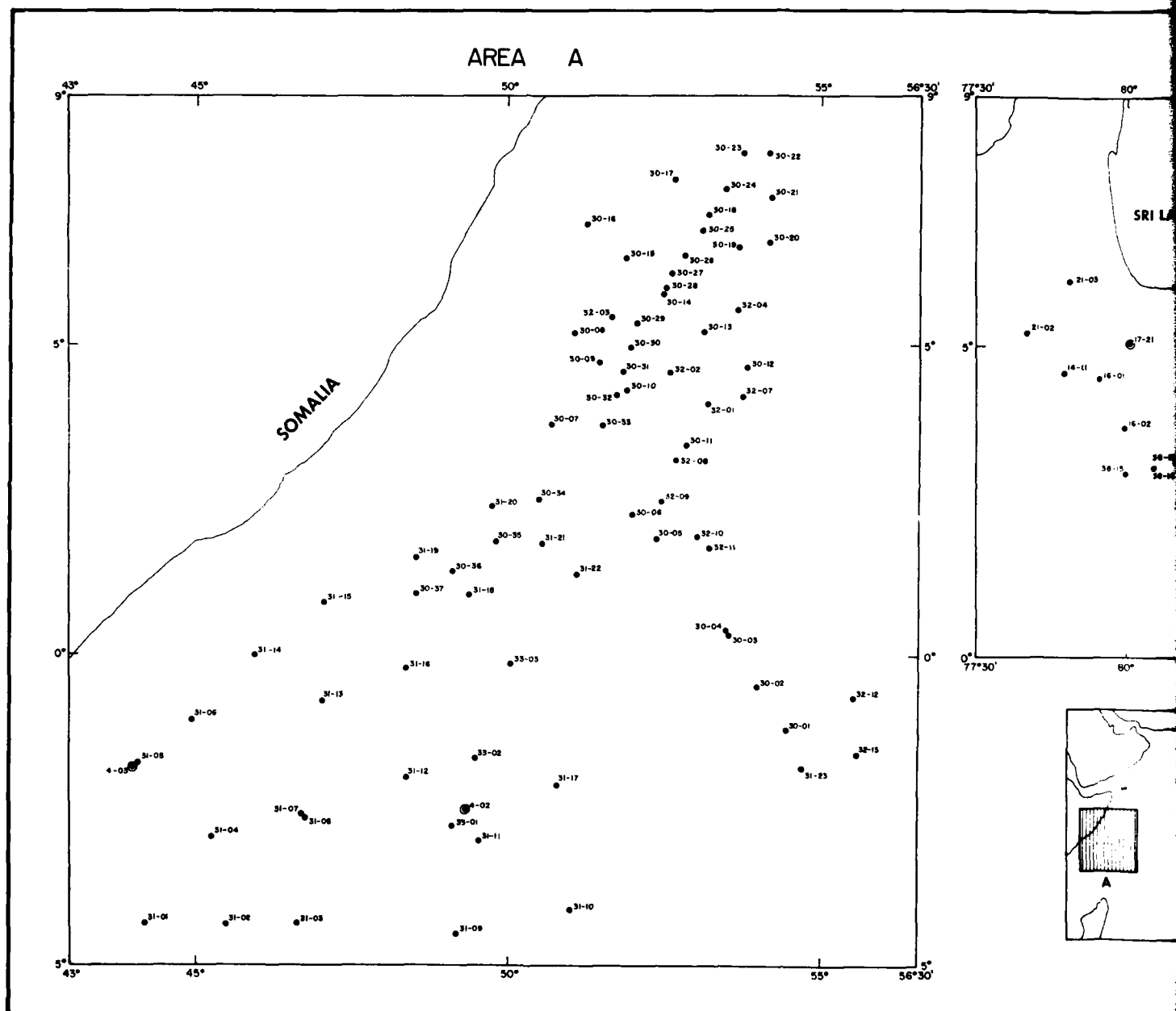
**FIGURE 5 WIDE ANGLE BOTTOM REFLECTION (WABR) STATIONS FOR SEDIMENT INTERVAL USNS WILKES INDIAN OCEAN SURVEYS—APRIL 1977-DECEMBER 1979**  
WABR stations are keyed to survey leg numbers; e.g., location 24-01 is leg 24, WABR 1. Sub-areas A and



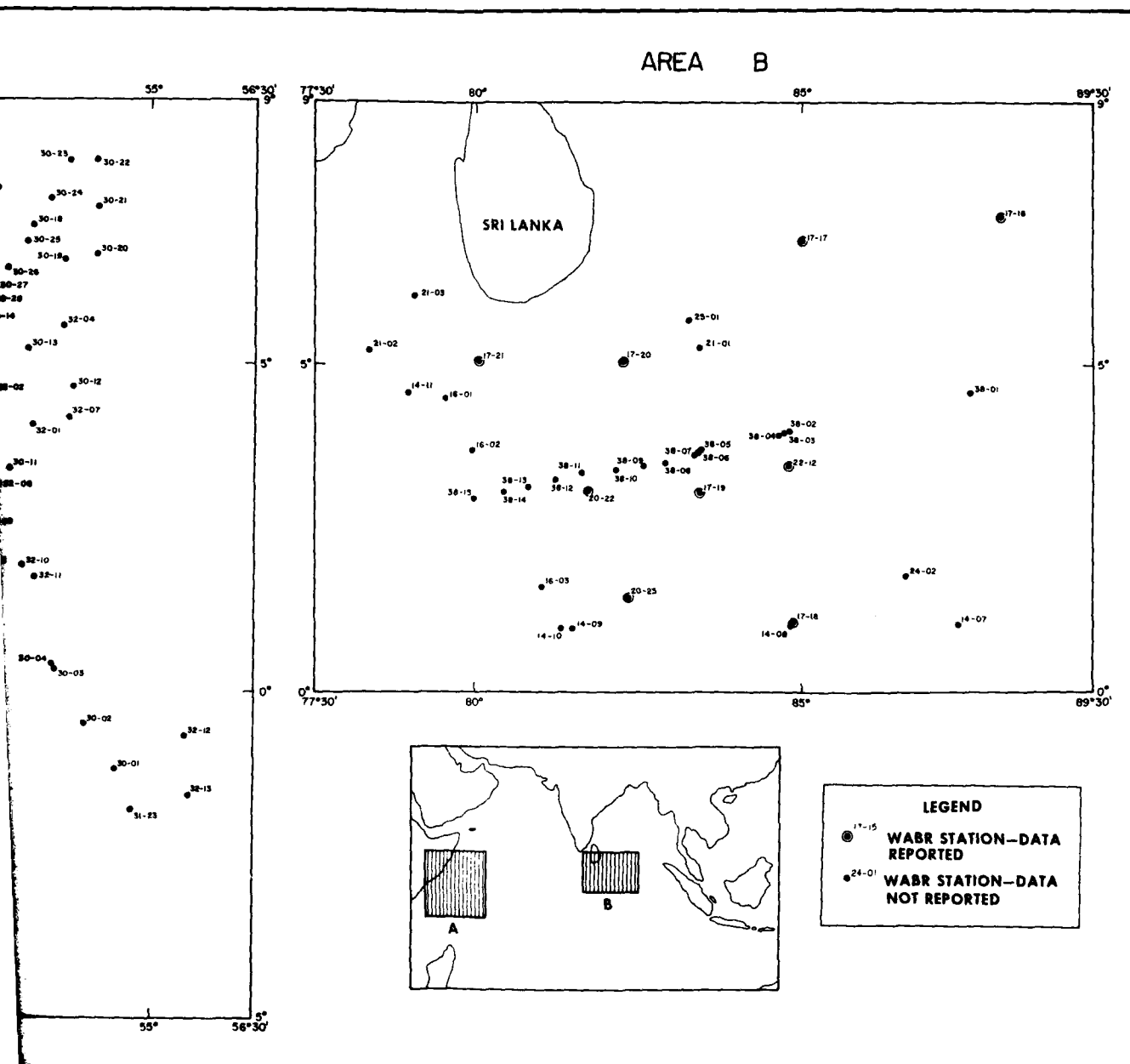
# STATIONS FOR SEDIMENT INTERVAL VELOCITY DETERMINATION, APRIL 1977-DECEMBER 1979

Station 24-01 is leg 24, WABR 1. Sub-areas A and B are expanded in Figure 6.

02



**FIGURE 6 WIDE ANGLE BOTTOM REFLECTION (WABR) STATIONS FOR SEDIMENT INTENSITY SURVEYS—APRIL 1977-DECEMBER 1979**



**WABR STATIONS FOR SEDIMENT INTERVAL VELOCITY DETERMINATION,  
SURVEYS—APRIL 1977-DECEMBER 1979**

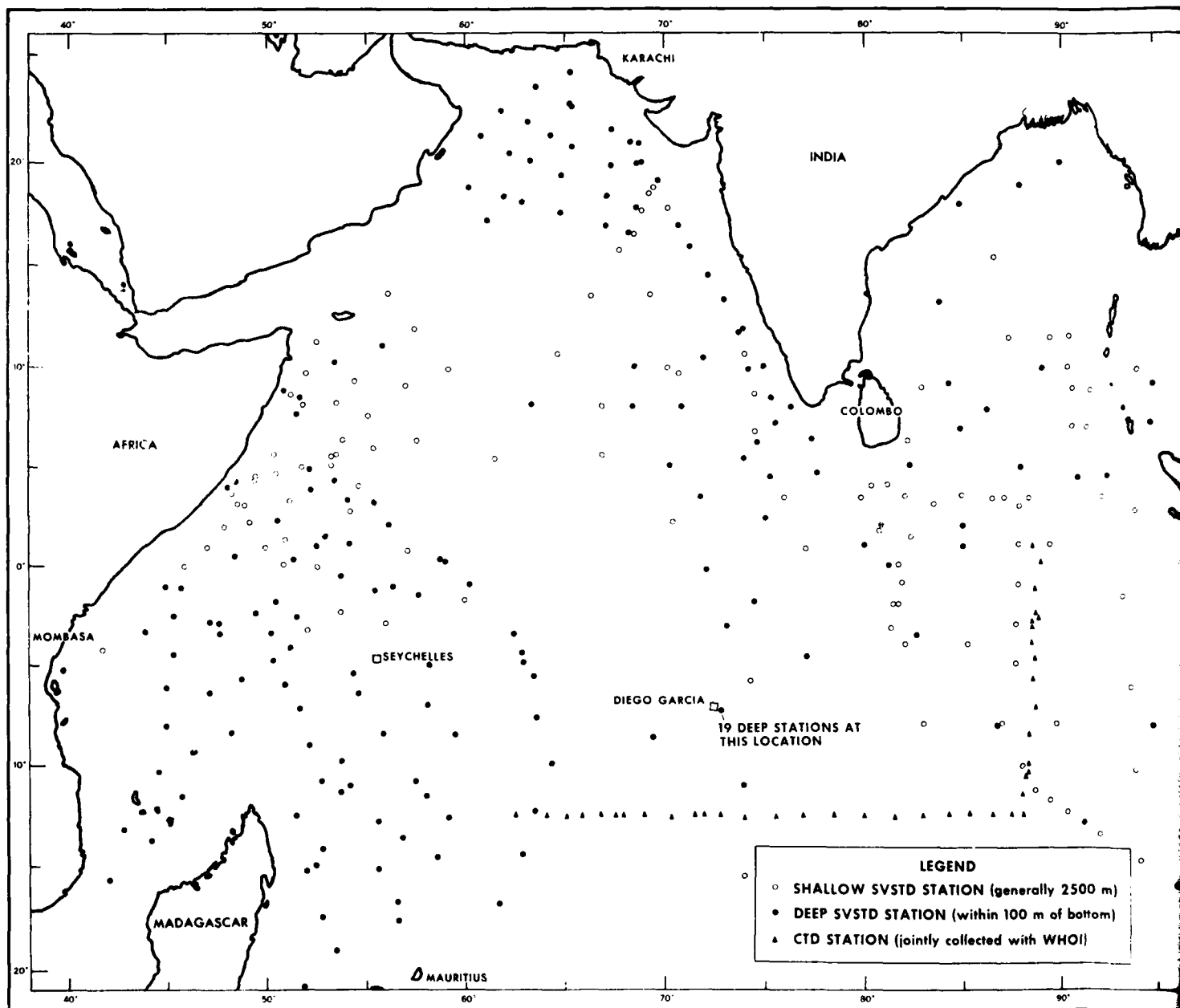
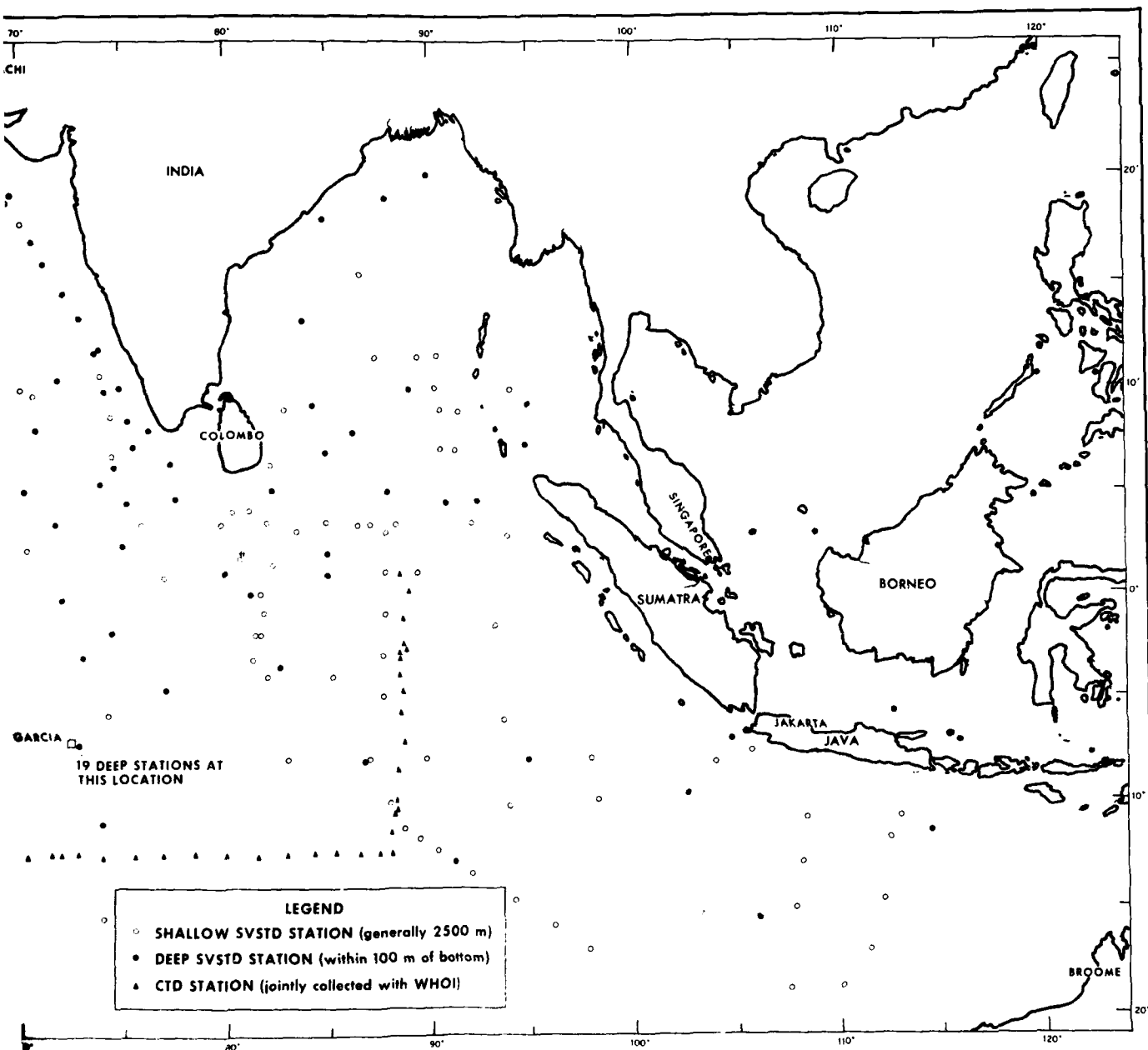
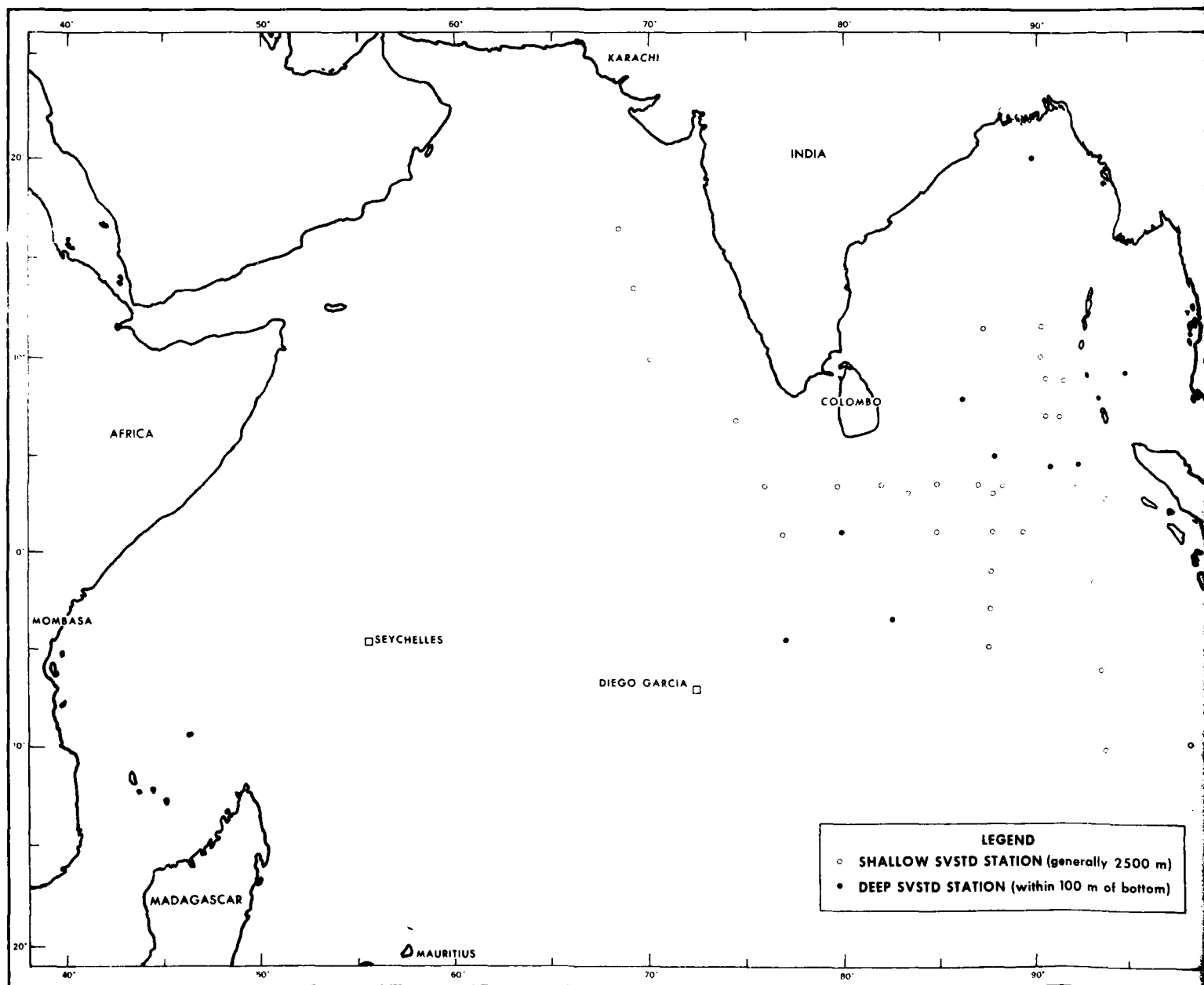


FIGURE 7 OCEANOGRAPHIC STATION COMPOSITE, USNS WILKES INDIAN OCEAN SURVEY

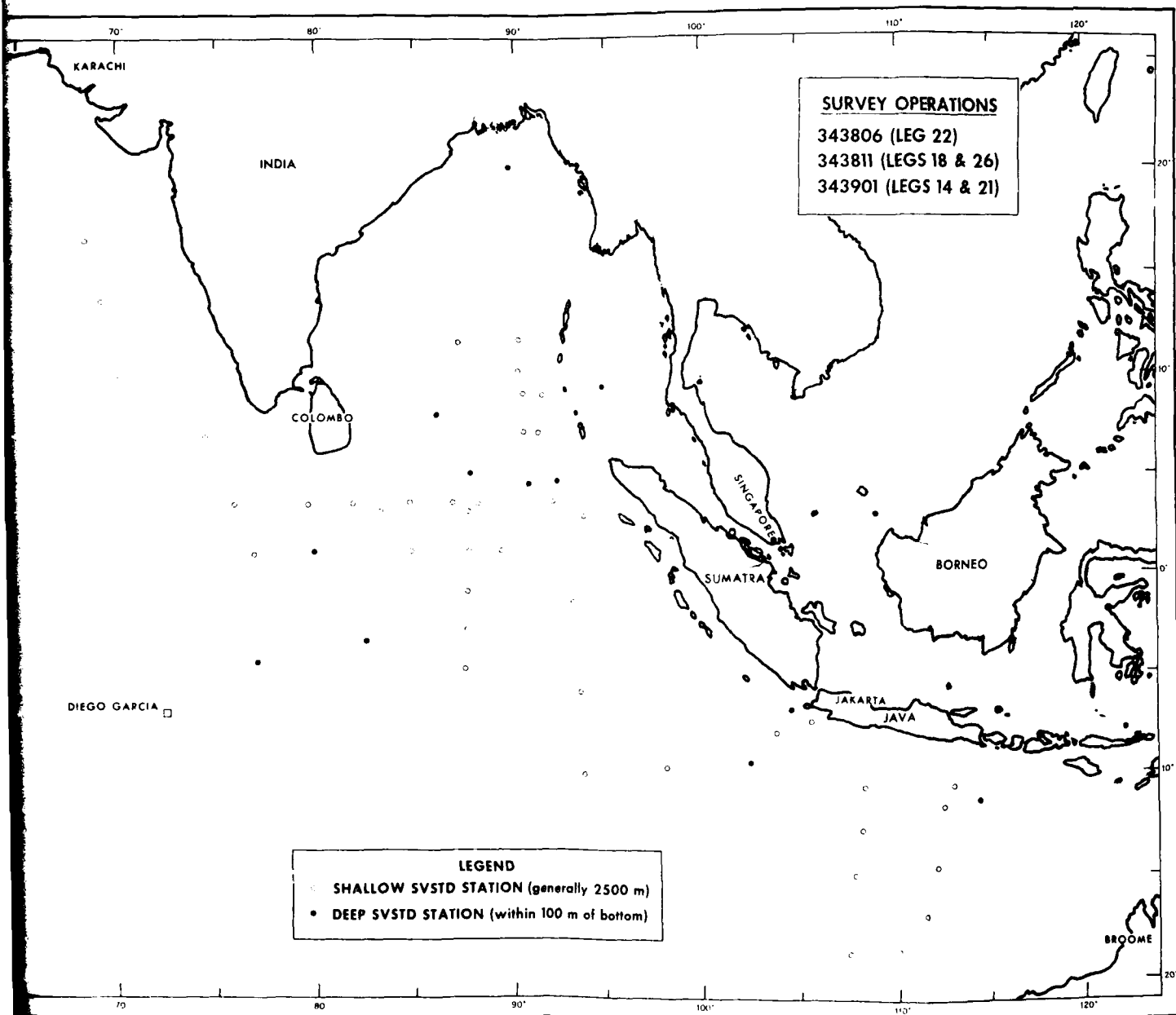


IMPOSITE, USNS WILKES INDIAN OCEAN SURVEYS—APRIL 1977-DECEMBER 1979



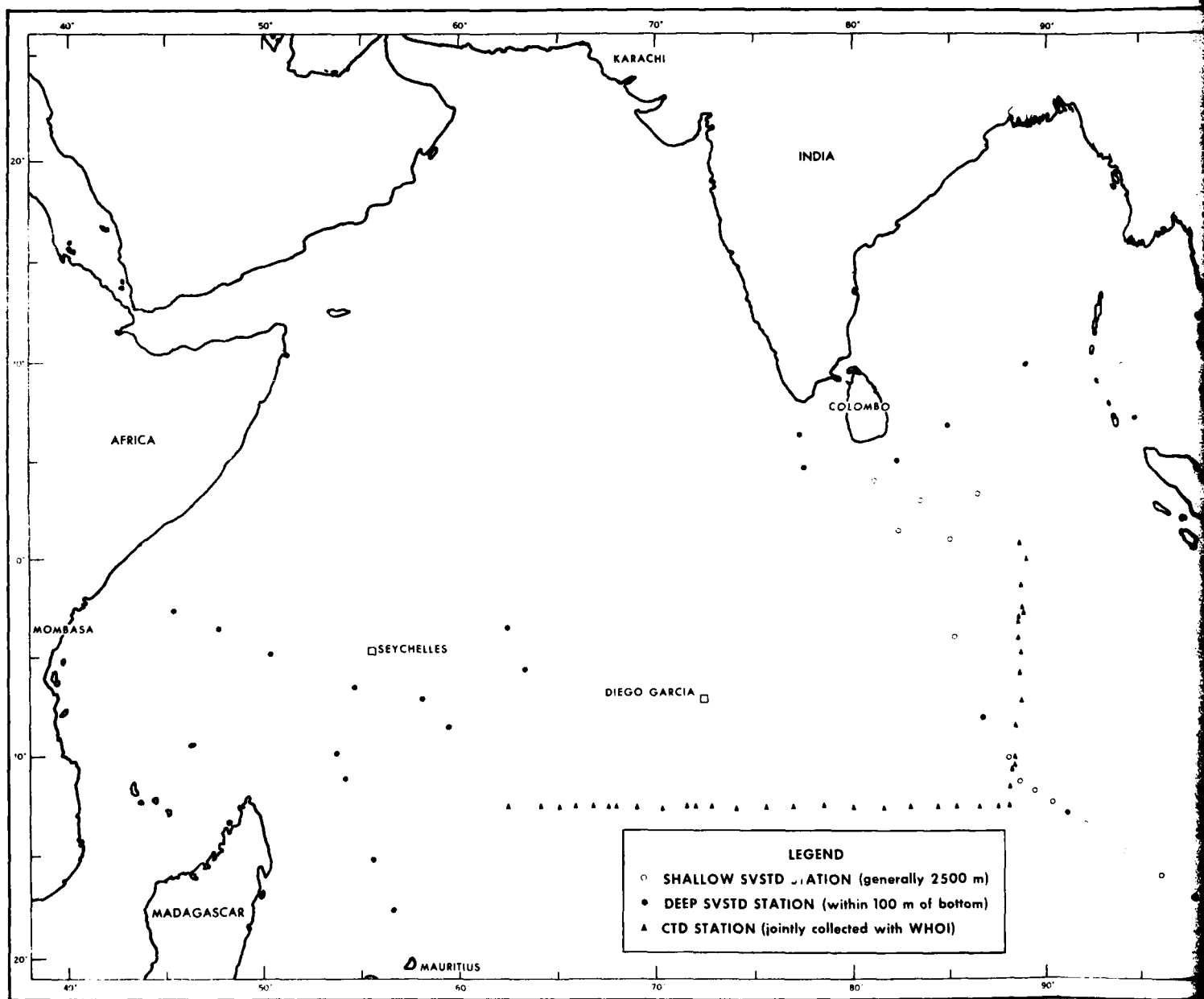
**FIGURE 8 OCEANOGRAPHIC STATIONS, WINTER MONSOON (DECEMBER 1977-DECEMBER 1978)  
USNS WILKES INDIAN OCEAN SURVEYS—APRIL 1977-DECEMBER 1978**



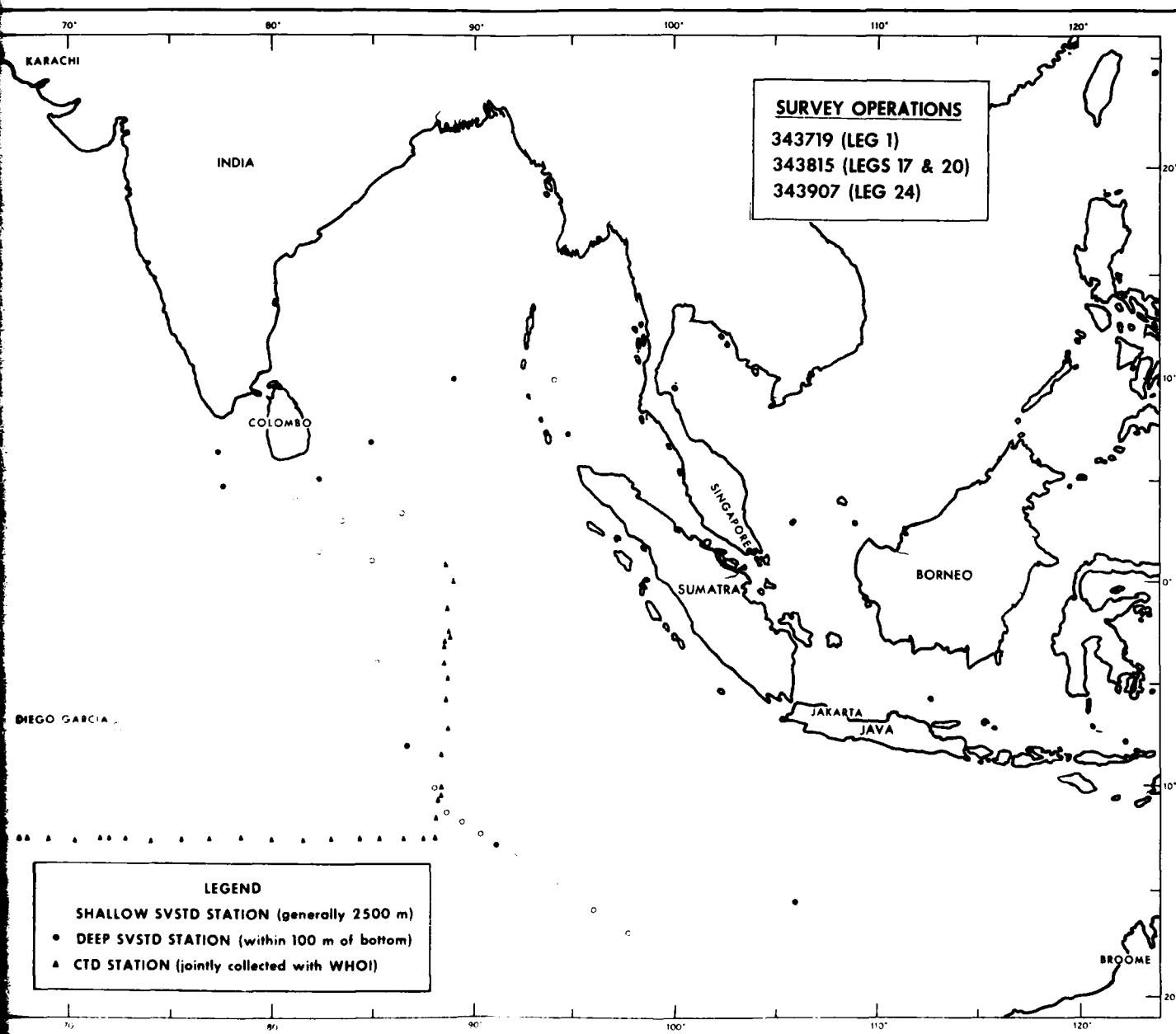


BATHYMETRIC STATIONS, WINTER MONSOON (DECEMBER-FEBRUARY),  
 WILKES INDIAN OCEAN SURVEYS—APRIL 1977-DECEMBER 1979

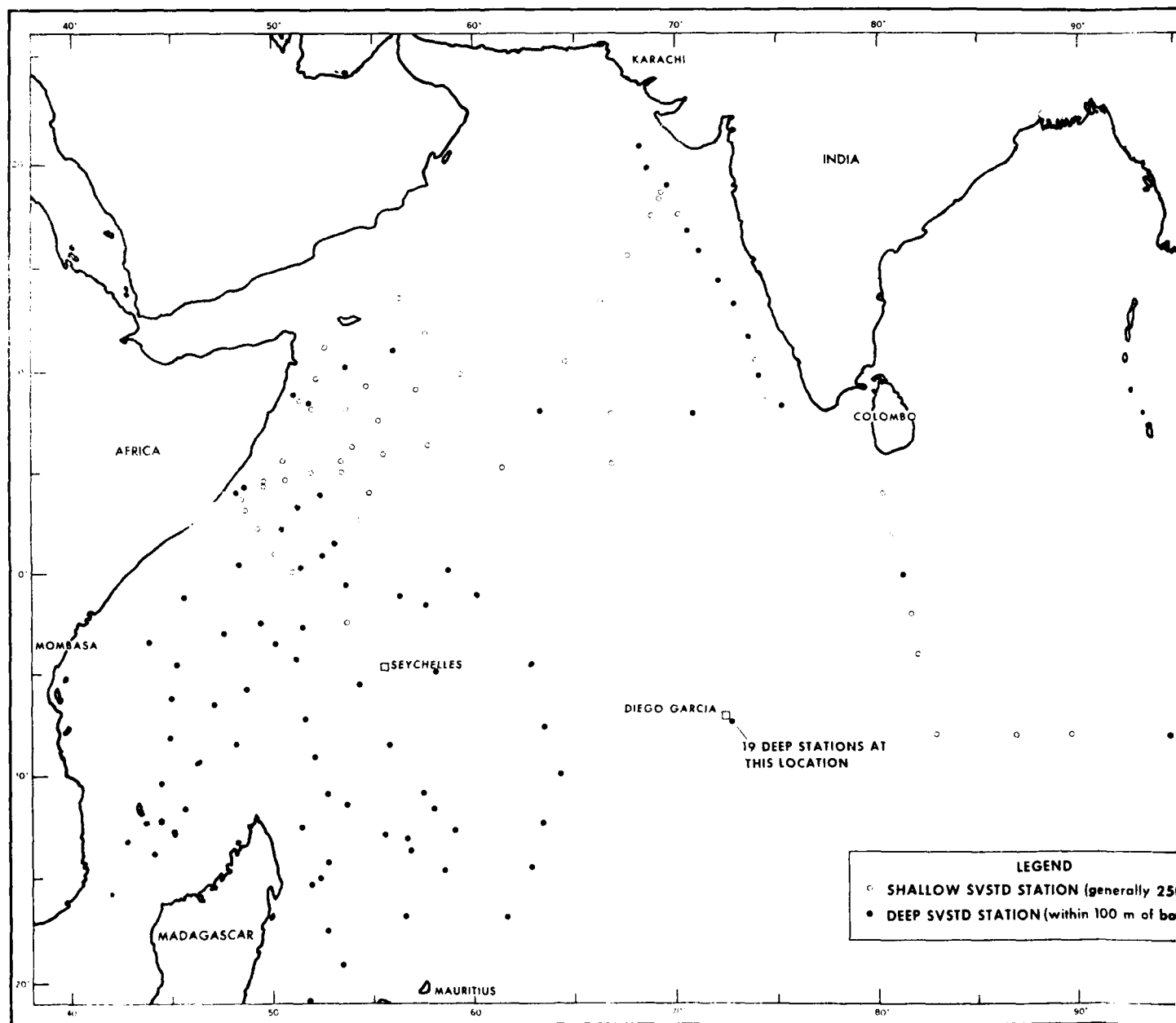
2



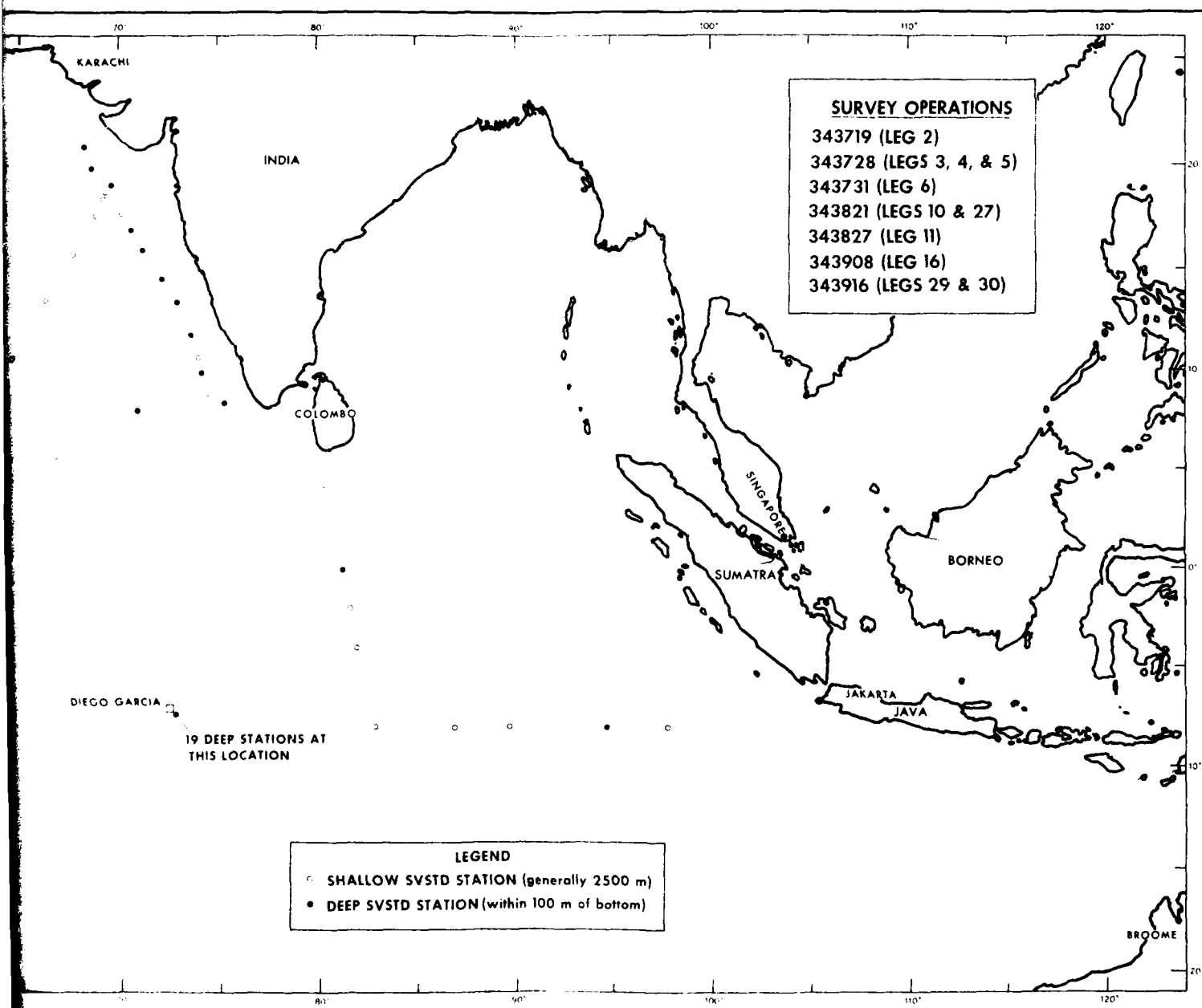
**FIGURE 9 OCEANOGRAPHIC STATIONS, SPRING TRANSITION (MAUSNS WILKES INDIAN OCEAN SURVEYS—APRIL 1977-DE**



**BATHYMETRIC STATIONS, SPRING TRANSITION (MARCH-APRIL),  
 WILKES INDIAN OCEAN SURVEYS—APRIL 1977-DECEMBER 1979**



**FIGURE 10 OCEANOGRAPHIC STATIONS, SUMMER MONSOON (USNS WILKES OCEAN SURVEYS—APRIL 1977-DECEMBER 1977)**



OCEANOGRAPHIC STATIONS, SUMMER MONSOON (MAY-SEPTEMBER),  
 U.S. WILKES OCEAN SURVEYS—APRIL 1977-DECEMBER 1979

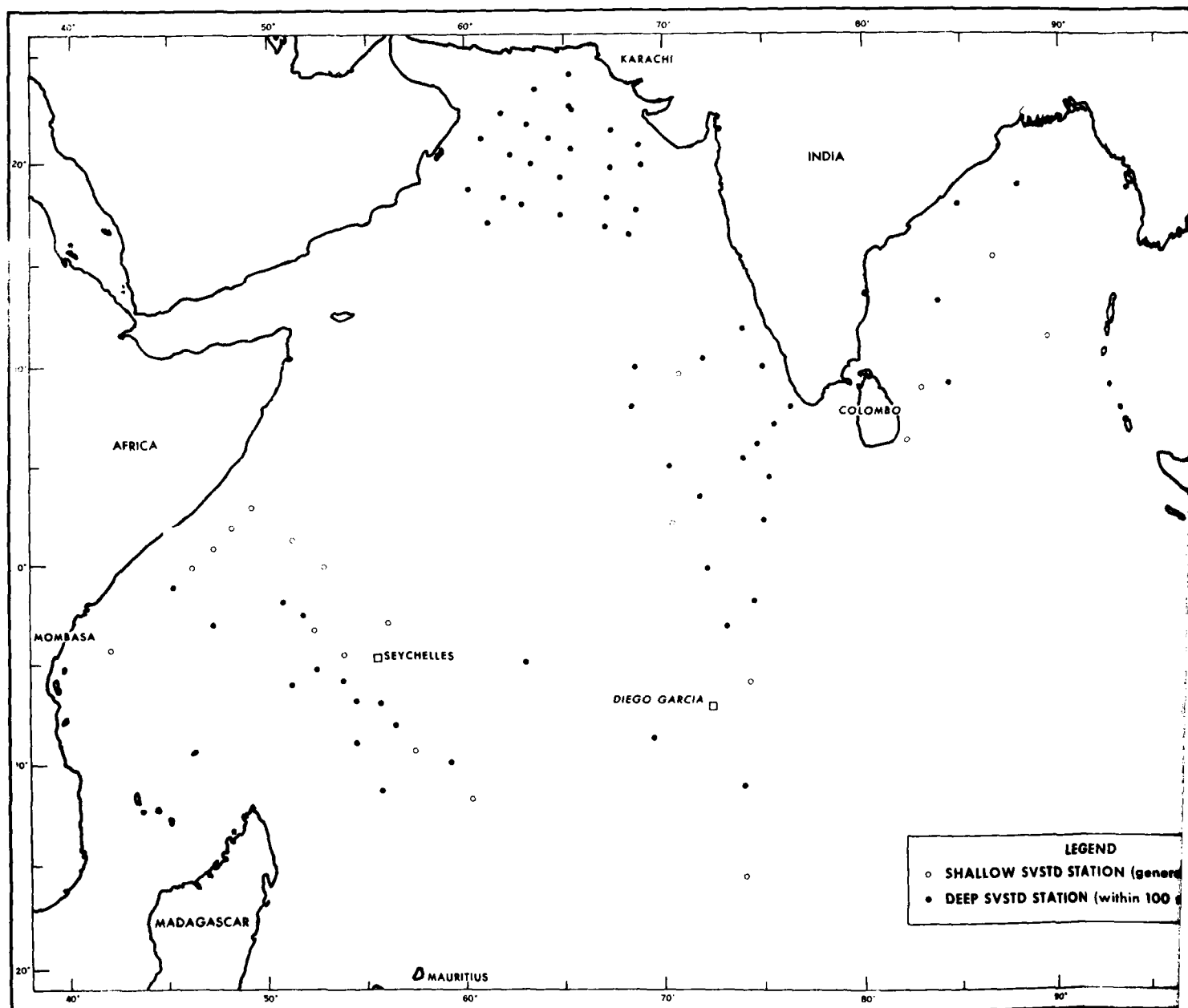
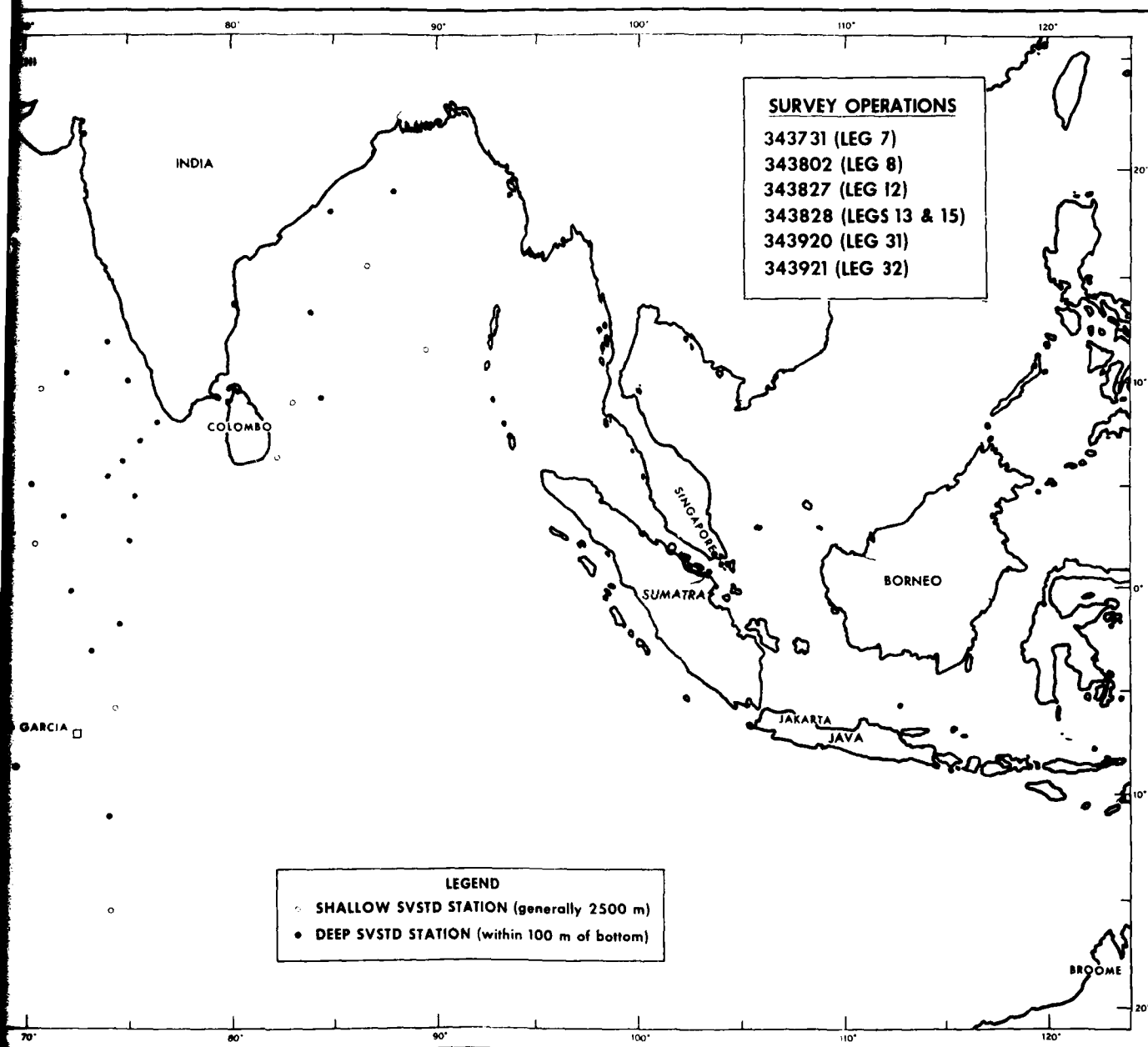


FIGURE 11 OCEANOGRAPHIC STATIONS, FALL TRANSITION (OCTOBER-NOVEMBER)  
USNS WILKES INDIAN OCEAN SURVEYS—APRIL 1977-DECEMBER 1977



GRAPHIC STATIONS, FALL TRANSITION (OCTOBER-NOVEMBER),  
S INDIAN OCEAN SURVEYS—APRIL 1977-DECEMBER 1979

APPENDIX A  
BOTTOM SEDIMENT CORE LOCATIONS



APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.) | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE                                       | REMARKS                                 |
|----------|------------|-------------------------|----------------|------------------|--|---|
| 1-01     | 343719     | 02°37.2'S<br>045°17.1'E | 422            | 4335             | Continental Rise,<br>Somali Basin                            |   |
| 1-02     | 343719     | 05°05.8'S<br>050°20.9'E | 406            | 5051             | Abyssal Floor,<br>Somali Basin                               |   |
| 1-03     | 343719     | 06°30.0'S<br>054°31.5'E | 389            | 3693             | Rise, Mascarene Basin<br>So. of Seychelles Bank              |   |
| 1-04     | 343719     | 07°07.7'S<br>057°57.8'E | 543            | 1630             | Mascarene Plateau  | Approx. 10 nm WSW<br>of DSDP Hole 237   |
| 1-05     | 343719     | 03°30.3'S<br>062°22.6'E | 430            | 4042             | Abyssal Hills between Carls-<br>berg Ridge & Mascarene Plat. |   |
| 1-06     | 343719     | 05°31.8'S<br>063°18.0'E | 356            | 4220             | Abyssal Hills between Carls-<br>berg Ridge & Mascarene Plat. |   |
| 1-07     | 343719     | 08°31.0'S<br>059°18.7'E | 73             | 1467             | Mascarene Plateau  |   |
| 1-08     | 343719     | 15°11.4'S<br>055°29.0'E | 308            | 4175             | Abyssal Floor,<br>Mascarene Basin                            |   |
| 2-01     | 343719     | 17°34.3'S<br>052°35.4'E | 339            | 4788             | Abyssal Plain<br>Mascarene Basin                             |   |
| 2-02     | 343719     | 15°03.5'S<br>052°14.9'E | 310            | 4360             | Continental Rise east of<br>Madagascar                       |   |
| 2-03     | 343719     | 12°44.1'S<br>058°46.1'E | 519            | 4120             | Abyssal Floor,<br>Mascarene Basin                            |   |
| 2-04     | 343719     | 10°56.3'S<br>052°36.0'E | 377            | 4560             | Abyssal Floor,<br>Mascarene Basin                            |   |
| 2-05     | 343719     |                         |                |                  |  | Core attempt aborted<br>Winch problems. |
| 2-06     | 343719     | 11°38.0'S<br>057°56.0'E | 284            | 4232             | Abyssal Floor<br>Mascarene Basin                             |   |

APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS (Cont.)

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.)     | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE                     | REMARKS                                  |
|----------|------------|-------------------------|--------------------|------------------|--|--|
| 2-07     | 343719     | 13°41.3'S<br>056°41.7'E | Catcher Sample 420 | 4315             | Abyssal Floor, Mascarene Basin             | Rock fragments in catcher only           |
| 2-08     | 343719     | 16°50.0'S<br>056°29.0'E | 420                | 4410             | Abyssal Floor, Mascarene Basin             |  |
| 3-01     | 343728     | 21°21.1'S<br>051°39.4'E | 307                | 4945             | Mascarene Abyssal Plain                    | 3.5 nm SSW of DSDP Hole 329              |
| 3-02     | 343728     | 15°22.9'S<br>051°51.0'E | 384                | 4170             | Continental Rise east of Madagascar        |  |
| 3-03     | 343728     | 08°31.5'S<br>055°48.3'E | 532                | 3448             | Continental Rise west of Mascarene Plateau |  |
| 3-04     | 343728     | 04°46.9'S<br>058°03.8'E | 426                | 4000             | Abyssal Floor, east of Seychelles Bank     |  |
| 3-05     | 343728     |                         |                    |                  |  | Core lost due to mechanical problems     |
| 3-06     | 343728     | 02°15.2'N<br>050°44.8'E | 552                | 5080             | Somali Abyssal Plain                       |  |
| 3-07     | 343728     | 00°23.0'S<br>048°07.1'E | 474                | 4743             | Continental Rise, Somali Basin             |  |
| 3-08     | 343728     | 02°57.6'S<br>047°28.2'E | 212                | 4839             | Somali Abyssal Plain                       |  |
| 3-09     | 373728     | 03°29.4'S<br>043°41.9'E | 477                | 3855             | Continental Rise, Somali Basin             |  |
| 4-01     | 343728     | 04°33.1'S<br>045°06.1'E | 587                | 4590             | Continental Rise, Somali Basin             | Bent barrel on 1st attempt, 2nd try O.K. |
| 4-02     | 343728     | 05°50.2'S<br>048°36.2'E | 436                | 4810             | Somali Abyssal Plain                       |  |
| 4-03     | 343728     | 04°14.7'S<br>051°04.9'E | 477                | 5060             | Somali Abyssal Plain                       |  |

APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS (Cont.)

| CORE NO.       | SURVEY NO. | POSITION                | RECOVERY (cm.)    | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE  | REMARKS   |
|----------------|------------|-------------------------|-------------------|------------------|---|---|
| 4-04           | 343728     | 00°31.3'S<br>053°31.7'E | 511               | 4810             | Abyssal Hills,<br>Somali Basin                                  | No core attempts<br>for these numbers                             |
| 4-05,<br>06,07 | 343728     |                         |                   |                  |   | Bent barrel on 1st<br>attempt, 2nd try O.K.                       |
| 4-08           | 343728     | 00°18.1'N<br>051°07.5'E | 208               | 5068             | Somali Abyssal Plain  | No core attempt.  |
| 4-09           | 343728     |                         |                   |                  |   | No core attempt<br>for 4-10.                                      |
| 4-10A          | 343728     | 02°26.6'S<br>053°36.9'E | 551               | 4190             | Abyssal Hills,<br>Somali Basin                                  |   |
| 5-01           | 343728     | 07°17.5'S<br>051°32.6'E | 476               | 4435             | Abyssal Floor,<br>Somali Basin                                  |   |
| 5-02           | 343728     | 01°38.4'S<br>057°34.9'E | 567               | 4420             | Abyssal Hills,<br>NE of Seychelles Bank                         | 4.5nm NW of DSDP<br>Hole 236                                      |
| 5-03           | 343728     | 00°19.5'N<br>058°57.6'E | 518               | 4675             | SW Flank of Carlsberg<br>Ridge, Somali Basin                    |   |
| 5-04           | 343728     | 10°00.0'S<br>064°17.0'E | 389               | 3875             | Abyssal Plain between Mas-<br>cerene Plat. & Cent. Indian Ridge |   |
| 5-05           | 343728     | 12°24.7'S<br>063°28.0'E | 377               | 4020             | Same as 5-04  |   |
| 5-06           | 343728     | 14°31.5'S<br>062°50.3'E | 483               | 3823             | Same as 5-04  |   |
| 5-07           | 343728     | 16°55.1'S<br>061°37.9'E | Catcher<br>Sample | 1870             |   | Small amount of<br>volcanic ash.                                  |
| 6-00           | 343731     | 09°09.0'S<br>052°06.0'E | Catcher<br>Sample | 4025             | Abyssal Floor,<br>Mascarene Basin                               | Not a core of record.<br>Recovered coral chips.<br>Cutter dented. |
| 6-01           | 343731     | 19°09.1'S<br>053°19.9'E | 223               | 4865             | Mascarene Abyssal Plain   |   |

APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS (Cont.)

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.)    | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE   | REMARKS  |
|----------|------------|-------------------------|-------------------|------------------|--|--|
| 6-02     | 343731     | 03°29.4'S<br>050°02.0'E | 582               | 5035             | Somali Abyssal Plain   | 1.5 nm. W of DSDP Hole 240                                   |
| 6-03     | 343731     | 06°26.6'S<br>047°00.2'E | 574               | 4573             | Somali Abyssal Plain   |  |
| 6-04     | 343731     | 10°25.9'S<br>044°26.6'E | 286               | 3540             | Continental Rise,<br>Southern Somali Basin                       |  |
| 6-05     | 343731     | 10°19.2'S<br>042°38.2'E | 195               | 3319             | Same as 6-04   |  |
| 6-06     | 343731     | 15°48.8'S<br>041°48.2'E | 313               | 2237             | Continental Rise,<br>Mozambique Channel                          | 2 nm NW of DSDP Hole 242                                     |
| 6-07     | 343731     | 08°29.2'S<br>048°01.6'E | 527               | 4480             | Somali Abyssal Plain   |  |
| 6-08     | 343731     | 08°11.2'S<br>044°49.4'E | 380               | 1446             | Continental Rise,<br>Somali Basin                                |  |
| 7-00     | 343731     | 05°01.5'N<br>070°13.1'E | None              | 3875             | Abyssal Hills, South of<br>Indus Cone                            | Not a core of record<br>No recovery<br>Cutter badly damaged. |
| 7-01     | 343731     | 02°57.8'S<br>055°57.1'E | 561               | 3665             | Continental Rise, north<br>of Seychelles Bank                    |  |
| 7-02     | 343731     | 08°43.7'S<br>069°22.9'E | 550               | 3855             | Central Indian Ridge<br>Eastern Flank                            |  |
| 7-03     | 343731     | 03°03.9'S<br>073°03.6'E | 598               | 3142             | Slope, Chagos-Laccadive<br>Ridge                                 |  |
| 7-04     | 343731     | 00°10.1'S<br>072°02.7'E | Catcher<br>Sample | 4200             | Abyssal floor between Chagos-<br>Laccadive & Cent. Indian Ridges |  |
| 7-05     | 343731     | 05°03.9'N<br>070°16.7'E | 541               | 4045             | Abyssal Hills South of Indus<br>Cone.                            |  |

APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS (Cont.)

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.) | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE                         | REMARKS |
|----------|------------|-------------------------|----------------|------------------|--|---------|
| 7-06     | 343731     | 10°01.1'N<br>068°28.2'E | 133            | 4473             | Indus Cone                                     |         |
| 8-01     | 343802     | 23°49.5'N<br>066°15.0'E | 588            | 150              | Continental Shelf,<br>vicinity of Murray Ridge |         |
| 8-02     | 343802     | 22°35.0'N<br>065°17.6'E | 344            | 2340             | Indus Cone                                     |         |
| 8-03     | 343802     | 21°12.9'N<br>064°11.4'E | 402            | 3340             | Indus Cone                                     |         |
| 8-04     | 343802     | 19°58.7'N<br>063°13.9'E | 402            | 3389             | Indus Cone                                     |         |
| 8-05     | 343802     | 18°18.8'N<br>061°52.0'E | 455            | 3693             | Indus Cone                                     |         |
| 8-06     | 343802     | 17°09.2'N<br>061°03.5'E | 479            | 3910             | Indus Cone                                     |         |
| 8-07     | 343802     | 16°31.0'N<br>068°38.4'E | 491            | 3653             | Indus Cone                                     |         |
| 8-08     | 343802     | 21°04.5'N<br>060°44.2'E | 264            | 3305             | Continental Rise                               |         |
| 8-09     | 343802     | 19°45.3'N<br>067°13.5'E | 359            | 2919             | Indus Cone                                     |         |
| 8-10     | 343802     | 20°25.6'N<br>069°29.5'E | 139            | 96               | Continental Shelf                              |         |
| 8-11     | 343802     | 21°28.6'N<br>067°13.6'E | 279            | 2096             | Indus Cone                                     |         |
| 8-12     | 343802     | 24°08.1'N<br>065°11.1'E | 294            | 2291             | Continental Slope,<br>Oman Basin               |         |
| 9-01     | 343821     | 07°45.8'N<br>055°18.8'E | 217            | 4500             | Chain Ridge                                    |         |

APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS (Cont.)

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.) | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE               | REMARKS           |
|----------|------------|-------------------------|----------------|------------------|--------------------------------------|-------------------|
| 9-02     | 343821     | 07°14.5'N<br>057°29.0'E | 418            | 3900             | Carlsberg Ridge<br>Flank             |                   |
| 9-03     | 343821     | 15°13.0'N<br>065°07.0'E | 141            | 3815             | Indus Cone                           |                   |
| 9-04     | 343821     | 23°01.0'N<br>061°05.0'E | 198            | 3340             | Oman Abyssal Plain                   |                   |
| 10-01    | 343821     | 08°23.0'N<br>075°20.5'E | 225            | 2040             | Continental Rise,<br>Laccadive Basin |                   |
| 10-02    | 343821     | 11°44.4'N<br>073°40.8'E | 230            | 2055             | Continental Rise,<br>Laccadive Basin |                   |
| 10-03    | 343821     | 15°11.2'N<br>071°15.0'E | 252            | 2060             | Indian Continental Slope             |                   |
| 10-04    | 343821     | 16°54.7'N<br>070°38.3'E | 597            | 3080             | Indus Cone                           |                   |
| 10-05    | 343821     | 18°43.0'N<br>069°22.1'E | 250            | 3080             | Indus Cone                           |                   |
| 10-06    | 343821     | 20°55.2'N<br>068°15.7'E | 286            | 2600             | Indus Cone                           |                   |
| 11-01    | 343827     | 15°44.2'N<br>067°37.6'E | 289            | 3794             | Indus Cone                           |                   |
| 11-02    | 343827     | 13°29.5'N<br>066°14.3'E | 78             | 4025             | Indus Cone                           |                   |
| 11-03    | 343827     | 10°32.6'N<br>064°37.7'E | 134            | 4359             | Indus Cone                           |                   |
| 11-04    | 343827     | 06°55.8'N<br>062°26.1'E | 516            | 4532             | Abyssal Hills South of<br>Indus Cone |                   |
| 11-05    | 343827     | 07°58.5'N<br>066°50.1'E | 100            | 4598             | Abyssal Hills South of<br>Indus Cone | Core barrel bent. |

APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS (Cont.)

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.) | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE                       | REMARKS          |
|----------|------------|-------------------------|----------------|------------------|--|------------------|
| 11-06    | 343827     | 05°27.6'N<br>071°11.6'E | 65             | 3970             | Abyssal Hills west of Chagos-Laccadive Ridge |                  |
| 12-01    | 343827     | 11°04.6'S<br>073°56.3'E | 329            | 5070             | Abyssal Hills, Central Indian Basin          |                  |
| 12-02    | 343827     | 05°53.4'S<br>074°13.1'E | 322            | 4730             | Abyssal Hills, Central Indian Basin          |                  |
| 12-03    | 343827     | 02°18.0'N<br>075°00.3'E | 471            | 2350             | Abyssal Hills, Central Indian Basin          |                  |
| 13-01    | 343828     | 08°58.0'N<br>082°55.0'E | 161            | 3735             | Ganges Cone                                  |                  |
| 13-02    | 343828     | 13°14.0'N<br>083°51.0'E | 54             | 3296             | Ganges Cone                                  |                  |
| 13-03    | 343828     | 17°58.0'N<br>084°52.0'E | 516            | 2413             | Ganges Cone                                  |                  |
| 13-04    | 343828     | 18°54.5'N<br>087°53.6'E | 335            | 2240             | Ganges Cone                                  |                  |
| 13-05    | 343828     | 15°23.3'N<br>086°34.6'E | 43             | 2850             | Ganges Cone                                  |                  |
| 13-06    | 343828     | 11°28.5'N<br>089°29.1'E | 210            | 3167             | Ganges Cone                                  |                  |
| 14-01    | 343901     | 06°27.2'N<br>092°19.7'E | 72             | 4280             | Nicobar Fan                                  | Core barrel bent |
| 14-02    | 343901     | 11°19.5'N<br>087°15.2'E | 17             | 3303             | Ganges Cone                                  |                  |
| 14-03    | 343901     | 15°37.8'N<br>088°35.7'E | 215            | 2658             | Ganges Cone                                  |                  |
| 14-04    | 343901     | 19°59.9'N<br>089°58.2'E | 234            | 1352             | Ganges Cone                                  |                  |

APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS (Cont.)

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.) | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE                         | REMARKS |
|----------|------------|-------------------------|----------------|------------------|--|---------|
| 14-05    | 343901     | 15°09.5'N<br>090°16.1'E | 228            | 2680             | Ganges Cone                                    |         |
| 14-06    | 343901     | 10°00.2'N<br>090°24.0'E | 187            | 3320             | Ganges Cone                                    |         |
| 14-07    | 343901     | 01°01.2'N<br>089°27.4'E | 305            | 3030             | Slope, Ninetyeast Ridge                        |         |
| 15-01    | 343828     | 00°24.2'N<br>072°41.6'E | 141            | 2944             | Slope, Chagos-Laccadive Ridge                  |         |
| 15-02    | 343828     | 03°29.3'N<br>071°44.6'E | 448            | 3975             | Abyssal Plain - West of Chagos-Laccadive Ridge |         |
| 15-03    | 343828     | 06°09.9'N<br>074°38.7'E | 263            | 2750             | Laccadive Abyssal Plain                        |         |
| 15-04    | 343828     | 11°31.4'N<br>074°30.3'E | 256            | 1490             | Continental Slope                              |         |
| 15-05    | 343828     | 11°39.0'N<br>073°34.0'E | 242            | 2010             | Continental Rise, Laccadive Basin              |         |
| 15-06    | 343828     | 08°34.0'N<br>069°63.0'E | 257            | 4613             | Indus Cone                                     |         |
| 15-07    | 343828     | 00°46.0'N<br>078°04.0'E | 320            | 4730             | Ceylon Abyssal Plain                           |         |
| 15-08    | 343828     | 04°33.0'N<br>079°07.0'E | 158            | 4750             | Ceylon Abyssal Plain                           |         |
| 16-01    | 343908     | 04°09.8'N<br>079°36.4'E | 185            | 4275             | Ceylon Abyssal Plain                           |         |
| 16-02    | 343908     | 03°01.0'S<br>081°21.6'E | 431            | 5011             | Ceylon Abyssal Plain                           |         |
| 17-01    | 343815     | 07°00.4'N<br>095°23.1'E | 272            | 1745             | Rise, east side Andaman-Nicobar Ridge          |         |



APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS (Cont.)

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.) | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE                   | REMARKS |
|----------|------------|-------------------------|----------------|------------------|--|---------|
| 17-02    | 343815     | 09°56.1'N<br>094°09.5'E | 210            | 3110             | Abyssal Floor,<br>Andaman Basin          |         |
| 17-03    | 343815     | 09°58.3'N<br>089°02.8'E | 134            | 3365             | Ganges Cone                              |         |
| 17-04    | 343815     | 06°52.5'N<br>084°52.8'E | 209            | 3865             | Ganges Cone                              |         |
| 17-05    | 343815     | 03°02.0'N<br>083°29.0'E | 22             | 4235             | Ganges Cone                              |         |
| 17-06    | 343815     | 05°03.9'N<br>082°19.1'E | 197            | 4150             | Ganges Cone                              |         |
| 18-01    | 343811     | 08°48.7'S<br>108°48.7'E | 283            | 3565             | Java Trench Slope                        |         |
| 18-02    | 343811     | 12°00.8'S<br>108°24.2'E | 402            | 5250             | Abyssal Floor,<br>Wharton Basin          |         |
| 18-03    | 343811     | 15°10.8'S<br>108°02.6'E | 264            | 5620             | Cascoyne Abyssal Plain,<br>Wharton Basin |         |
| 18-04    | 343811     | 18°58.9'S<br>107°43.6'E | 458            | 5553             | Cascoyne Abyssal Plain,<br>Wharton Basin |         |
| 18-05    | 343811     | 19°55.9'S<br>108°45.6'E | 424            | 4835             | Abyssal Floor,<br>Wharton Basin          |         |
| 18-06    | 343811     | 17°45.9'S<br>111°36.9'E | 410            | 5015             | Abyssal Floor,<br>Wharton Basin          |         |
| 18-07    | 343811     | 14°46.5'S<br>112°20.9'E | 376            | 4285             | Abyssal Floor,<br>Wharton Basin          |         |
| 18-08    | 343811     | 11°19.5'S<br>112°53.9'E | 526            | 3613             | Abyssal Floor South of<br>Java Trench    |         |
| 18-09    | 343811     | 10°35.3'S<br>112°59.5'E | 466            | 4970             | Java Trench                              |         |

APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS (Cont.)

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.) | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE                           | REMARKS                        |
|----------|------------|-------------------------|----------------|------------------|--|--------------------------------|
| 18-10    | 343811     | 10°54.8'S<br>114°25.1'E | 306            | 5015             | Java Trench                                      |                                |
| 20-01    | 343815     | 08°06.4'S<br>086°47.5'E | 319            | 5271             | Abyssal Hills, Central Indian Basin              | 1 nm North of DSDP Hole 215    |
| 20-02    | 343815     | 11°20.0'S<br>088°42.5'E | 28             | 1660             | Top Ninetyeast Ridge                             |                                |
| 20-03    | 343815     | 13°29.1'S<br>092°11.6'E | Catcher Sample | 5048             | Abyssal Hills, Cocos Basin                       |                                |
| 20-04    | 343815     | 14°46.2'S<br>094°16.4'E | 443            | 5798             | Abyssal Hills, Cocos Basin                       |                                |
| 20-05    | 343815     | 17°04.5'S<br>097°54.4'E | 240            | 5140             | Abyssal Hills, West Australia Basin              |                                |
| 20-06    | 343815     | 16°54.5'S<br>099°00.0'E | Catcher Sample | 4585             | Investigator Fracture Zone, West Australia Basin | Solid plug in Catcher & Cutter |
| 20-07    | 343815     | 16°44.7'S<br>099°50.8'E | 351            | 5483             | Abyssal Hills, West Australia Basin              |                                |
| 20-08    | 343815     | 15°32.9'S<br>106°09.8'E | 492            | 6140             | Abyssal Floor, West Australia Basin              |                                |
| 21-01    | 343901     | 03°02.9'S<br>087°45.3'E | 116            | 4835             | Ganges Cone                                      |                                |
| 21-02    | 343901     | 03°33.5'S<br>082°36.8'E | 354            | 3625             | West Flank Afanasit Seamount                     |                                |
| 21-03    | 343901     | 04°35.6'S<br>077°06.8'E | 167            | 4830             | Abyssal Hills South of Ceylon Abyssal Plain      |                                |
| 21-04    | 343901     | 00°44.7'N<br>077°04.0'E | 374            | 4605             | Rise, east of Maldiva Is.                        |                                |
| 22-01    | 343806     | 18°54.6'N<br>067°55.6'E | 341            | 3275             | Indus Cone                                       |                                |

APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS (Cont.)

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.)    | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE                    | REMARKS                                 |
|----------|------------|-------------------------|-------------------|------------------|---|---|
| 22-02    | 343806     | 13°31.3'N<br>069°12.2'E | 500               | 4165             | Indus Cone                                |   |
| 22-03    | 343806     | 09°55.5'N<br>070°06.4'E | 572               | 4530             | Indus Cone                                |   |
| 22-04    | 343806     | 08°59.6'N<br>072°52.0'E | 444               | 1820             | Chagos-Laccadive Ridge                    | 2.3 nm North of<br>DSDP Hole 219        |
| 22-05    | 343806     | 06°44.9'N<br>074°32.3'E | 454               | 2757             | Abyssal Floor,<br>Laccadive Basin         |   |
| 22-06    | 343806     | 04°25.3'N<br>074°31.5'E | 500               | 2643             | Abyssal Floor,<br>Laccadive Basin         |   |
| 22-07    | 343806     | 03°25.0'N<br>078°12.8'E | 540               | 3189             | Continental Rise,<br>Central Indian Basin |   |
| 22-08    | 343806     | 03°23.7'N<br>087°01.0'E | 54                | 4165             | Indus Cone                                |   |
| 22-09    | 343806     | 03°29.5'N<br>092°12.3'E | 175               | 4143             | Nicobar Fan                               |   |
| 22-10    | 343806     | 06°21.1'N<br>094°13.9'E | 288               | 1628             | Continental Rise,<br>Andaman Basin        |   |
| 22-11    | 343806     | 05°58.8'N<br>096°36.1'E | 73                | 1338             | Slope, east side<br>Andaman Basin         |   |
| 26-00    | 343811     | 08°23.8'N<br>092°40.9'E | Catcher<br>Sample | 1250             | Andaman Nicobar Ridge                     | No core for record.<br>Rock chips only. |
| 26-01    | 343811     | 07°04.2'S<br>104°54.8'E | 233               | 2095             | Trough, Landward side<br>of Java Trench   |   |
| 26-02    | 343811     | 07°25.8'S<br>104°16.8'E | 170               | 6250             | Java Trench                               |   |
| 26-03    | 343811     | 04°32.6'N<br>092°28.5'E | 267               | 4240             | Nicobar Fan                               |   |

APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS (Cont.)

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.) | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE            | REMARKS                            |
|----------|------------|-------------------------|----------------|------------------|-----------------------------------|------------------------------------|
| 26-04    | 343811     | 08°55.1'N<br>090°39.7'E | 408            | 3225             | Ninetyeast Ridge                  | 5.4 nm East of DSDP Hole 217       |
| 26-05    | 343811     | 08°04.7'N<br>095°39.3'E | 344            | 1573             | Slope, east side of Andaman Basin |                                    |
| 26-06    | 343811     | 05°56.3'N<br>097°56.7'E | 176            | 113              | Continental Shelf, Andaman Basin  |                                    |
| 27-00    | 343821     | 07°57.3'N<br>090°59.4'E | None           | 5205             | Abyssal Floor, Wharton Basin      | No core for record. Cutter dented. |
| 27-01    | 343821     | 07°37.5'S<br>102°44.9'E | 220            | 6000             | Java Trench                       |                                    |
| 27-02    | 343821     | 07°57.8'S<br>101°59.0'E | 56             | 5530             | Abyssal Floor, Wharton Basin      |                                    |
| 27-03    | 343821     | 07°57.1'S<br>097°57.9'E | 109            | 4797             | Abyssal Floor, Wharton Basin      |                                    |
| 27-04    | 343821     | 08°00.8'S<br>096°45.8'E | 30             | 4810             | Abyssal Floor, Wharton Basin      |                                    |
| 27-05    | 343821     | 07°59.8'S<br>088°43.5'E | 402            | 3225             | Slope, west side Ninetyeast Ridge |                                    |
| 30-01    | 343916     | 08°09.4'N<br>051°47.1'E | None           | 4843             | Continental Rise, Somali Basin    | No core.                           |
| 30-02    | 343916     | 06°21.5'N<br>053°58.0'E | 384            | 5068             | Somali Abyssal Plain              | No recovery, mechanical problems.  |
| 30-03    | 343916     | 08°26.1'N<br>054°19.1'E | 223            | 5050             | Somali Abyssal Plain              |                                    |
| 30-04    | 343916     | 06°58.0'N<br>053°11.1'E | 273            | 5050             | Somali Abyssal Plain              |                                    |

APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.) | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE                | REMARKS |
|----------|------------|-------------------------|----------------|------------------|---------------------------------------|---------|
| 30-06    | 343916     | 05°36.5'N<br>052°17.1'E | 244            | 5063             | Somali Abyssal Plain                  |         |
| 30-07    | 343916     | 03°58.0'N<br>051°41.2'E | 506            | 5070             | Somali Abyssal Plain                  |         |
| 30-08    | 343916     | 03°23.7'N<br>051°20.5'E | 603            | 4950             | Somali Abyssal Plain                  |         |
| 30-09    | 343916     | 02°22.0'S<br>044°36.1'E | 363            | 4015             | Rise, Somali Basin                    |         |
| 31-01    | 343920     | 04°14.9'S<br>041°46.8'E | 322            | 2932             | Rise, western Somali Basin            |         |
| 31-02    | 343920     | 02°23.2'S<br>044°38.7'E | 321            | 4030             | Rise, western Somali Basin            |         |
| 31-03    | 343920     | 01°02.3'S<br>044°58.5'E | 282            | 3835             | Rise, western Somali Basin            |         |
| 31-04    | 343920     | 01°50.7'S<br>050°29.6'E | 368            | 5048             | Rise, western Somali Basin            |         |
| 31-05    | 343920     | 03°11.0'S<br>052°06.6'E | 292            | 5033             | Rise, western Somali Basin            |         |
| 31-06    | 343920     | 03°00.9'N<br>048°58.5'E | 344            | 3847             | Rise, western Somali Basin            |         |
| 31-07    | 343920     | 02°39.5'S<br>055°04.8'E | Catcher        | 2880             | Ridge adjacent to Seychelles Platform |         |
| 32-01    | 343921     | 06°35.9'N<br>050°30.3'E | Sample 433     | 2315             | Continental Rise, Somali Basin        |         |
| 32-02    | 343921     | 01°35.2'N<br>057°16.8'E | 540            | 4550             | Abyssal Hills, Somali Basin           |         |
| 32-03    | 343921     | 00°29.9'N<br>058°03.8'E | 566            | 4712             | Abyssal Floor, Somali Basin           |         |

4.8 nm NW of DSDP Hole 4030

APPENDIX A. BOTTOM SEDIMENT CORE LOCATIONS (Cont.)

| CORE NO. | SURVEY NO. | POSITION                | RECOVERY (cm.) | WATER DEPTH (m.) | PHYSIOGRAPHIC PROVINCE              | REMARKS |
|----------|------------|-------------------------|----------------|------------------|-------------------------------------|---------|
| 32-04    | 343921     | 04°17.9'N<br>053°32.7'E | 597            | 5090             | Somali Abyssal Plain                |         |
| 32-05    | 343921     | 03°14.2'N<br>052°42.4'E | 552            | 5092             | Somali Abyssal Plain                |         |
| 32-06    | 343921     | 02°23.5'N<br>052°23.1'E | 451            | 5087             | Somali Abyssal Plain                |         |
| 32-07    | 343921     | 01°26.3'N<br>053°40.7'E | 593            | 5080             | Somali Abyssal Plain                |         |
| 32-08    | 343921     | 00°52.3'N<br>054°40.5'E | 520            | 4760             | Abyssal Floor, eastern Somali Basin |         |
| 32-09    | 343921     | 01°17.5'S<br>055°30.0'E | 427            | 4568             | Abyssal Floor, eastern Somali Basin |         |

APPENDIX B

WIDE ANGLE BOTTOM REFLECTION STATION LOCATIONS

APPENDIX B. WIDE ANGLE BOTTOM REFLECTION STATION LOCATIONS

| WABR<br>NO. | SURVEY<br>NO. | POSITION |            | JULIAN<br>DAY | Z-TIME | PHYSIOGRAPHIC PROVINCE |
|-------------|---------------|----------|------------|---------------|--------|------------------------|
|             |               | LAT.     | LONG.      |               |        |                        |
| 04-01*      | 343728        | 05°43'S  | - 048°44'E | 198           |        | Somali Basin           |
| 04-02*      | 343728        | 02°28'S  | - 049°18'E | 204           |        | Somali Basin           |
| 04-03*      | 343728        | 01°48'S  | - 043°59'E | 206           |        | Somali Basin           |
| 06-04*      | 343731        | 10°26'S  | - 044°27'E | 259           |        | Somali Basin           |
| 08-05*      | 343802        | 17°33'N  | - 064°40'E | 316           |        | Indus Cone             |
| 08-06*      | 343802        | 17°37'N  | - 068°36'E | 318           |        | Indus Cone             |
| 14-01       | 343901        | 13°50'N  | - 088°00'E | 015           | 1238   | Ganges Cone            |
| 14-02       | 343901        | 14°01'N  | - 088°01'E | 015           | 1518   | Ganges Cone            |
| 14-03       | 343901        | 17°03'N  | - 090°08'E | 018           | 1656   | Ganges Cone            |
| 14-04       | 343901        | 15°19'N  | - 090°14'E | 019           | 0440   | Ganges Cone            |
| 14-05       | 343901        | 12°48'N  | - 090°24'E | 020           | 0308   | Ganges Cone            |
| 14-06       | 343901        | 09°52'N  | - 090°25'E | 021           | 0839   | Ganges Cone            |
| 14-07       | 343901        | 01°03'N  | - 087°26'E | 024           | 1727   | Ganges Cone            |
| 14-08       | 343901        | 01°02'N  | - 084°49'E | 025           | 1246   | Ganges Cone            |
| 14-09       | 343901        | 00°59'N  | - 081°31'E | 026           | 0902   | Ceylon Abyssal Plain   |
| 14-10       | 343901        | 00°59'N  | - 081°20'E | 026           | 1025   | Ceylon Abyssal Plain   |
| 14-11       | 343901        | 04°34'N  | - 078°58'E | 028           | 0358   | Ceylon Abyssal Plain   |
| 16-01       | 343908        | 04°30'N  | - 079°32'E | 127           | 1730   | Ceylon Abyssal Plain   |
| 16-02       | 343908        | 03°42'N  | - 079°58'E | 128           | 0456   | Ceylon Abyssal Plain   |
| 16-03       | 343908        | 01°37'N  | - 081°02'E | 128           | 2125   | Ceylon Abyssal Plain   |
| 17-15*      | 343815        | 09°54'N  | - 088°58'E | 072           |        | Ganges Cone            |
| 17-16*      | 343815        | 07°16'N  | - 088°04'E | 073           |        | Ganges Cone            |
| 17-17*      | 343815        | 06°55'N  | - 085°00'E | 074           |        | Ganges Cone            |
| 17-18*      | 343815        | 01°02'N  | - 084°50'E | 077           |        | Ganges Cone            |
| 17-19*      | 343815        | 03°03'N  | - 083°26'E | 078           |        | Ganges Cone            |
| 17-20*      | 343815        | 05°03'N  | - 082°16'E | 079           |        | Ganges Cone            |
| 17-21*      | 343815        | 05°04'N  | - 080°03'E | 080           |        | Ganges Cone            |



APPENDIX B. WIDE ANGLE BOTTOM REFLECTION STATION LOCATIONS (Cont.)

| WABR<br>NO. | SURVEY<br>NO. | POSITION<br>LAT. | LONG.      | JULIAN<br>DAY | Z-TIME | PHYSIOGRAPHIC PROVINCE              |
|-------------|---------------|------------------|------------|---------------|--------|-------------------------------------|
| 20-22*      | 343815        | 03°04'N          | - 081°44'E | 097           |        | Ganges Cone                         |
| 20-23*      | 343815        | 01°27'N          | - 082°22'E | 097           |        | Ganges Cone                         |
| 21-01       | 343901        | 05°17'N          | - 083°22'E | 039           | 1726   | Ganges Cone                         |
| 21-02       | 343901        | 05°14'N          | - 078°21'E | 053           | 2232   | Rise, North of Ceylon Abyssal Plain |
| 21-03       | 343901        | 06°04'N          | - 079°03'E | 054           | 0708   | Rise, North of Ceylon Abyssal Plain |
| 22-07*      | 343806        | 18°52'N          | - 067°55'E | 338           |        | Indus Cone                          |
| 22-08*      | 343806        | 16°28'N          | - 068°25'E | 338           |        | Indus Cone                          |
| 22-09*      | 343806        | 13°29'N          | - 069°11'E | 339           |        | Indus Cone                          |
| 22-10*      | 343806        | 08°29'N          | - 074°35'E | 342           |        | Laccadive Basin                     |
| 22-11*      | 343806        | 05°57'N          | - 074°30'E | 343           |        | Laccadive Basin                     |
| 22-12*      | 343806        | 03°29'N          | - 084°48'E | 347           |        | Ganges Cone                         |
| 24-01       | 343907        | 01°33'S          | - 062°20'E | 086           | 0948   | Somali Basin                        |
| 24-02       | 343907        | 01°47'N          | - 086°38'E | 115           | 0450   | Ganges Cone                         |
| 25-01       | 343908        | 05°41'N          | - 083°16'E | 182           | 0700   | Ganges Cone                         |
| 26-13*      | 343811        | 08°10'S          | - 093°59'E | 041           |        | Wharton Basin                       |
| 26-14*      | 343811        | 04°01'S          | - 093°22'E | 043           |        | Nicobar Fan                         |
| 30-01       | 343916        | 01°11'S          | - 054°27'E | 257           | 1152   | Somali Basin                        |
| 30-02       | 343916        | 00°30'S          | - 053°59'E | 257           | 1822   | Somali Basin                        |
| 30-03       | 343916        | 00°21'N          | - 053°31'E | 258           | 0157   | Somali Basin                        |
| 30-04       | 343916        | 00°25'N          | - 053°29'E | 258           | 0812   | Somali Basin                        |
| 30-05       | 343916        | 01°54'N          | - 052°22'E | 258           | 2239   | Somali Basin                        |
| 30-06       | 343916        | 02°17'N          | - 051°59'E | 259           | 0356   | Somali Basin                        |
| 30-07       | 343916        | 03°44'N          | - 050°41'E | 259           | 2347   | Somali Basin                        |
| 30-08       | 343915        | 05°13'N          | - 051°03'E | 261           | 0323   | Somali Basin                        |
| 30-09       | 343916        | 04°44'N          | - 051°27'E | 261           | 0844   | Somali Basin                        |
| 30-10       | 343916        | 04°17'N          | - 051°53'E | 261           | 1328   | Somali Basin                        |
| 30-11       | 343916        | 03°24'N          | - 052°50'E | 262           | 0253   | Somali Basin                        |
| 30-12       | 343916        | 04°40'N          | - 053°49'E | 263           | 1115   | Somali Basin                        |
| 30-13       | 343916        | 05°14'N          | - 053°07'E | 263           | 2101   | Somali Basin                        |

APPENDIX B. WIDE ANGLE BOTTOM REFLECTION STATION LOCATIONS (Cont.)

| WABR<br>NO. | SURVEY<br>NO. | POSITION<br>LAT. | LONG.      | JULIAN<br>DAY | Z-TIME | PHYSIOGRAPHIC PROVINCE |
|-------------|---------------|------------------|------------|---------------|--------|------------------------|
| 30-14       | 343916        | 05°50'N          | - 052°29'E | 264           | 0316   | Somali Basin           |
| 30-15       | 343916        | 06°24'N          | - 051°53'E | 264           | 0933   | Somali Basin           |
| 30-16       | 343916        | 06°58'N          | - 051°15'E | 264           | 1610   | Somali Basin           |
| 30-17       | 343916        | 07°40'N          | - 052°39'E | 265           | 1429   | Somali Basin           |
| 30-18       | 343916        | 07°06'N          | - 053°12'E | 265           | 2024   | Somali Basin           |
| 30-19       | 343916        | 06°36'N          | - 053°41'E | 266           | 0151   | Somali Basin           |
| 30-20       | 343916        | 06°40'N          | - 054°10'E | 266           | 1912   | Somali Basin           |
| 30-21       | 343916        | 07°23'N          | - 054°12'E | 267           | 0152   | Somali Basin           |
| 30-22       | 343916        | 08°06'N          | - 054°09'E | 267           | 0852   | Somali Basin           |
| 30-23       | 343916        | 08°06'N          | - 053°45'E | 268           | 0154   | Somali Basin           |
| 30-24       | 343916        | 07°31'N          | - 053°30'E | 268           | 0755   | Somali Basin           |
| 30-25       | 343916        | 06°52'N          | - 053°06'E | 268           | 1818   | Somali Basin           |
| 30-26       | 343916        | 06°27'N          | - 052°48'E | 268           | 2338   | Somali Basin           |
| 30-27       | 343916        | 06°10'N          | - 052°37'E | 269           | 0230   | Somali Basin           |
| 30-28       | 343916        | 05°56'N          | - 052°31'E | 269           | 0542   | Somali Basin           |
| 30-29       | 343916        | 05°23'N          | - 052°04'E | 269           | 1739   | Somali Basin           |
| 30-30       | 343916        | 04°58'N          | - 051°57'E | 269           | 2154   | Somali Basin           |
| 30-31       | 343916        | 04°36'N          | - 051°49'E | 270           | 0132   | Somali Basin           |
| 30-32       | 343916        | 04°12'N          | - 051°43'E | 270           | 0506   | Somali Basin           |
| 30-33       | 343916        | 03°43'N          | - 051°30'E | 270           | 1524   | Somali Basin           |
| 30-34       | 343916        | 02°31'N          | - 050°30'E | 271           | 0649   | Somali Basin           |
| 30-35       | 343916        | 01°50'N          | - 049°48'E | 271           | 1356   | Somali Basin           |
| 30-36       | 343916        | 01°22'N          | - 049°06'E | 271           | 2108   | Somali Basin           |
| 30-37       | 343916        | 01°00'N          | - 048°31'E | 272           | 0241   | Somali Basin           |
| 31-01       | 343920        | 04°20'S          | - 044°11'E | 283           | 1017   | Somali Basin           |
| 31-02       | 343920        | 04°21'S          | - 045°29'E | 283           | 1933   | Somali Basin           |
| 31-03       | 343920        | 04°20'S          | - 046°37'E | 284           | 0907   | Somali Basin           |
| 31-04       | 343920        | 02°56'S          | - 045°15'E | 284           | 2216   | Somali Basin           |
| 31-05       | 343920        | 01°44'S          | - 044°03'E | 285           | 1212   | Somali Basin           |

APPENDIX B. WIDE ANGLE BOTTOM REFLECTION STATION LOCATIONS (Cont.)

| WABR<br>NO. | SURVEY<br>NO. | POSITION<br>LAT. | LONG.      | JULIAN<br>DAY | Z-TIME | PHYSIOGRAPHIC PROVINCE |
|-------------|---------------|------------------|------------|---------------|--------|------------------------|
| 31-06       | 343920        | 01°03'S          | - 044°55'E | 286           | 2130   | Somali Basin           |
| 31-07       | 343920        | 02°33'S          | - 046°41'E | 287           | 1410   | Somali Basin           |
| 31-08       | 343920        | 02°36'S          | - 046°45'E | 287           | 1523   | Somali Basin           |
| 31-09       | 343920        | 04°30'S          | - 049°10'E | 288           | 0936   | Somali Basin           |
| 31-10       | 343920        | 04°05'S          | - 051°00'E | 289           | 2315   | Somali Basin           |
| 31-11       | 343920        | 03°00'S          | - 049°32'E | 290           | 1311   | Somali Basin           |
| 31-12       | 343920        | 01°58'S          | - 048°23'E | 291           | 0036   | Somali Basin           |
| 31-13       | 343920        | 00°44'S          | - 047°01'E | 291           | 1309   | Somali Basin           |
| 31-14       | 343920        | 00°00'N          | - 045°56'E | 292           | 0154   | Somali Basin           |
| 31-15       | 343920        | 00°52'N          | - 047°03'E | 293           | 0419   | Somali Basin           |
| 31-16       | 343920        | 00°13'S          | - 048°22'E | 293           | 1542   | Somali Basin           |
| 31-17       | 343920        | 02°06'S          | - 050°47'E | 294           | 1944   | Somali Basin           |
| 31-18       | 343920        | 00°59'N          | - 049°23'E | 296           | 2111   | Somali Basin           |
| 31-19       | 343920        | 01°35'N          | - 048°32'E | 297           | 0638   | Somali Basin           |
| 31-20       | 343920        | 02°25'N          | - 049°44'E | 298           | 1428   | Somali Basin           |
| 31-21       | 343920        | 01°48'N          | - 050°32'E | 298           | 2347   | Somali Basin           |
| 31-22       | 343920        | 01°19'N          | - 051°05'E | 299           | 0839   | Somali Basin           |
| 31-23       | 343920        | 01°45'S          | - 054°45'E | 300           | 2108   | Somali Basin           |
| 32-01       | 343921        | 04°05'N          | - 053°11'E | 314           | 1312   | Somali Basin           |
| 32-02       | 343921        | 04°34'N          | - 052°35'E | 314           | 1920   | Somali Basin           |
| 32-03       | 343921        | 05°28'N          | - 051°39'E | 315           | 0935   | Somali Basin           |
| 32-04       | 343921        | 05°35'N          | - 053°40'E | 318           | 0443   | Somali Basin           |
| 32-05       | 343921        | 00°34'N          | - 058°23'E | 320           | 1117   | Somali Basin           |
| 32-06       | 343921        | 00°31'N          | - 058°04'E | 321           | 1857   | Somali Basin           |
| 32-07       | 343921        | 04°11'N          | - 053°45'E | 323           | 1152   | Somali Basin           |
| 32-08       | 343921        | 03°09'N          | - 052°41'E | 324           | 1028   | Somali Basin           |
| 32-09       | 343921        | 02°29'N          | - 052°27'E | 324           | 1625   | Somali Basin           |
| 32-10       | 343921        | 01°56'N          | - 053°02'E | 325           | 0330   | Somali Basin           |
| 32-11       | 343921        | 01°45'N          | - 053°13'E | 325           | 0547   | Somali Basin           |

APPENDIX B. WIDE ANGLE BOTTOM REFLECTION STATION LOCATIONS (Cont.)

| WABR NO. | SURVEY NO. | POSITION<br>LAT. | LONG.      | JULIAN DAY | Z-TIME | PHYSIOGRAPHIC PROVINCE |
|----------|------------|------------------|------------|------------|--------|------------------------|
| 32-12    | 343921     | 00°40'S          | - 055°32'E | 326        | 1616   | Somali Basin           |
| 32-13    | 343921     | 01°42'S          | - 055°36'E | 327        | 0605   | Somali Basin           |
| 33-01    | 343921     | 02°45'S          | - 049°06'E | 335        | 0737   | Somali Basin           |
| 33-02    | 343921     | 01°40'S          | - 049°30'E | 335        | 1523   | Somali Basin           |
| 33-03    | 343921     | 00°08'S          | - 050°02'E | 336        | 0143   | Somali Basin           |
| 38-01    | 343915     | 04°36'N          | - 087°36'E | 206        | 0644   | Ganges Cone            |
| 38-02    | 343915     | 04°00'N          | - 084°48'E | 207        | 0350   | Ganges Cone            |
| 38-03    | 343915     | 03°59'N          | - 084°43'E | 207        | 0540   | Ganges Cone            |
| 38-04    | 343915     | 03°56'N          | - 084°38'E | 207        | 0816   | Ganges Cone            |
| 38-05    | 343915     | 03°43'N          | - 083°28'E | 207        | 1900   | Ganges Cone            |
| 38-06    | 343915     | 03°40'N          | - 083°25'E | 207        | 2128   | Ganges Cone            |
| 38-07    | 343915     | 03°38'N          | - 083°22'E | 207        | 2351   | Ganges Cone            |
| 38-08    | 343915     | 03°31'N          | - 082°55'E | 208        | 0537   | Ganges Cone            |
| 38-09    | 343915     | 03°28'N          | - 082°35'E | 208        | 1011   | Ganges Cone            |
| 38-10    | 343915     | 03°24'N          | - 082°11'E | 208        | 1428   | Ganges Cone            |
| 38-11    | 343915     | 03°21'N          | - 081°39'E | 208        | 1933   | Ganges Cone            |
| 38-12    | 343915     | 03°15'N          | - 081°15'E | 208        | 2343   | Ganges Cone            |
| 38-13    | 343915     | 03°09'N          | - 080°49'E | 209        | 0340   | Ceylon Abyssal Plain   |
| 38-14    | 343915     | 03°04'N          | - 080°26'E | 209        | 0735   | Ceylon Abyssal Plain   |
| 38-15    | 343915     | 02°58'N          | - 080°00'E | 209        | 1216   | Ceylon Abyssal Plain   |

\* Data from these stations have been reported in NAVOCEANO technical note, TN-3432-02-78, "Sediment Interval Velocity Measurement from the USNS WILKES Surveys in the Indian Ocean, 1977-78".

APPENDIX C  
OCEANOGRAPHIC STATION LOCATIONS

APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS

| OPERATION<br>NO. | LEG<br>NO. | SVSTD<br>STATION<br>NO. | POSITION  |            | CORRECTED |                    | DATE    |
|------------------|------------|-------------------------|-----------|------------|-----------|--------------------|---------|
|                  |            |                         | LATITUDE  | LONGITUDE  | C/S       | SONIC<br>DEPTH (m) |         |
| 343719           | 01         | 001201                  | 02°38.3'S | 045°10.1'E | 4253      | 4291               | 4/12/77 |
|                  |            | 003002                  | 03°27.0'S | 047°30.9'E | 2409      | 4870               | 4/14/77 |
|                  |            | 004003                  | 04°55.1'S | 050°13.0'E | 5067      | 5081               | 4/15/77 |
|                  |            | 005004                  | 06°31.6'S | 054°30.9'E | 3692      | 3707               | 4/17/77 |
|                  |            | 006005                  | 07°05.8'S | 058°00.1'E | 1577      | 1582               | 4/18/77 |
|                  |            | 007006                  | 03°30.0'S | 062°21.8'E | 4033      | 4056               | 4/20/77 |
|                  |            | 008007                  | 05°33.3'S | 063°14.7'E | 4007      | 4039               | 4/22/77 |
|                  |            | 009008                  | 08°31.6'S | 059°21.2'E | 1291      | 1318               | 4/23/77 |
|                  |            | 011010                  | 09°55.7'S | 053°37.8'E | 4386      | 4420               | 4/26/77 |
|                  |            | 012011                  | 11°07.7'S | 054°03.7'E | 4495      | 4519               | 4/27/77 |
|                  |            | 013012                  | 15°12.7'S | 055°30.5'E | 4046      | 4087               | 4/29/77 |
|                  |            | 014013                  | 17°44.5'S | 056°31.2'E | 4332      | 4356               | 5/01/77 |
| 343719           | 02         | 201001                  | 17°35.0'S | 052°39.6'E | 4759      | 4856               | 5/10/77 |
|                  |            | 202002                  | 15°04.2'S | 052°15.8'E | 4327      | 4373               | 5/12/77 |
|                  |            | 203003                  | 14°39.2'S | 058°30.0'E | 4113      | 4193               | 5/13/77 |
|                  |            | 204004                  | 12°42.7'S | 059°01.5'E | 3965      | 4017               | 5/16/77 |
|                  |            | 205005                  | 12°55.1'S | 055°29.3'E | 4397      | 4418               | 5/17/77 |
|                  |            | 206006                  | 12°36.0'S | 051°21.0'E | 4229      | 4278               | 5/18/77 |
|                  |            | 207007                  | 10°56.2'S | 052°39.5'E | 4427      | 4402               | 5/20/77 |
|                  |            | 208008                  | 10°50.0'S | 057°24.3'E | 4102      | 4254               | 5/22/77 |
|                  |            | 209009                  | 11°38.8'S | 057°56.8'E | 4182      | 4242               | 5/24/77 |
|                  |            | 210010                  | 13°41.9'S | 056°45.6'E | 4202      | 4274               | 5/26/77 |
|                  |            | 211011                  | 16°51.6'S | 056°31.6'E | 4371      | 4466               | 5/27/77 |
| 343728           | 03         | 001001                  | 21°19.8'S | 051°40.1'E | 4909      | 4975               | 6/05/77 |
|                  |            | 002002                  | 15°21.0'S | 051°48.4'E | 4096      | 4181               | 6/08/77 |

APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS (Cont.)

| OPERATION<br>NO.  | LEG<br>NO. | SVSTD<br>STATION<br>NO. | POSITION  |            | CORRECTED<br>CAST<br>DEPTH (m) | CORRECTED<br>SONIC<br>DEPTH (m) | DATE    |
|-------------------|------------|-------------------------|-----------|------------|--------------------------------|---------------------------------|---------|
| 343728<br>(Cont.) | 03         | 003003                  | 11°24.8'S | 053°37.4'E | 4686                           | 4855                            | 6/10/77 |
|                   |            | 004004                  | 08°32.7'S | 055°42.7'E | 3431                           | 3495                            | 6/11/77 |
|                   |            | 005005                  | 04°45.4'S | 058°04.5'E | 3960                           | 4007                            | 6/13/77 |
|                   |            | 006006                  | 01°05.0'S | 056°15.8'E | 4536                           | 4581                            | 6/15/77 |
|                   |            | 007007                  | 00°57.6'N | 052°26.4'E | 5064                           | 5116                            | 6/16/77 |
|                   |            | 008008                  | 02°12.5'N | 050°24.6'E | 5016                           | 5051                            | 6/18/77 |
|                   |            | 009009                  | 00°22.0'N | 048°07.0'E | 4710                           | 4765                            | 6/20/77 |
|                   |            | 010010                  | 02°59.2'S | 047°28.0'E | 4804                           | 4856                            | 6/21/77 |
|                   |            | 011011                  | 03°25.4'S | 043°41.9'E | 3799                           | 3765                            | 6/23/77 |
|                   |            | 201001                  | 04°33.7'S | 045°08.8'E | 4586                           | 4609                            | 7/15/77 |
|                   |            | 202002                  | 05°48.1'S | 048°35.8'E | 4815                           | 4835                            | 7/17/77 |
| 343728            | 04         | 203003                  | 04°14.8'S | 051°04.4'E | 5061                           | 5091                            | 7/18/77 |
|                   |            | 210004                  | 02°24.7'S | 053°35.7'E | 3022                           | 4303                            | 7/19/77 |
|                   |            | 204005                  | 00°27.9'S | 053°32.5'E | 4908                           | 4921                            | 7/20/77 |
|                   |            | 208006                  | 00°17.5'N | 051°11.2'E | 5074                           | 5097                            | 7/21/77 |
|                   |            | 211007                  | 02°29.2'S | 049°19.6'E | 5014                           | 5016                            | 7/23/77 |
|                   |            | 212008                  | 01°12.2'S | 045°24.1'E | 4184                           | 4195                            | 7/24/77 |
|                   |            | 501009                  | 06°09.6'S | 044°46.9'E | 4358                           | 4374                            | 8/01/77 |
|                   |            | 502010                  | 07°16.3'S | 051°32.3'E | 4622                           | 4627                            | 8/03/77 |
|                   |            | 503011                  | 05°31.1'S | 054°15.4'E | 3380                           | 3405                            | 8/04/77 |
|                   |            | 504012                  | 01°33.1'S | 057°32.5'E | 4457                           | 4489                            | 8/10/77 |
|                   |            | 505013                  | 00°17.3'N | 058°49.1'E | 4627                           | 4650                            | 8/12/77 |
| 343728            | 05         | 506014                  | 00°59.7'S | 060°07.2'E | 4457                           | 4469                            | 8/14/77 |
|                   |            | 507015                  | 04°31.1'S | 062°48.3'E | 4398                           | 4402                            | 8/17/77 |
|                   |            | 508016                  | 07°40.7'S | 063°28.2'E | 4019                           | 4038                            | 8/19/77 |
|                   |            | 509017                  | 10°00.0'S | 064°14.9'E | 3805                           | 3972                            | 8/22/77 |

APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS (Cont.)

| OPERATION<br>NO.  | LEG<br>NO. | SVSTD<br>STATION<br>NO. | POSITION  |            | CORRECTED         |                    | CORRECTED |  | DATE     |
|-------------------|------------|-------------------------|-----------|------------|-------------------|--------------------|-----------|--|----------|
|                   |            |                         | LATITUDE  | LONGITUDE  | CAST<br>DEPTH (m) | SONIC<br>DEPTH (m) |           |  |          |
| 343728<br>(Cont.) | 05         | 510018                  | 12°21.5'S | 063°23.2'E | 3953              | 3975               |           |  | 8/25/77  |
|                   |            | 511019                  | 14°30.5'S | 062°48.8'E | 3384              | 3456               |           |  | 8/27/77  |
|                   |            | 512020                  | 16°54.0'S | 061°36.8'E | 1909              | 1750               |           |  | 8/29/77  |
| 343731            | 06         | 601001                  | 19°11.8'S | 053°21.3'E | 4900              | 4883               |           |  | 9/06/77  |
|                   |            | 602002                  | 14°16.4'S | 052°40.3'E | 4597              | 4599               |           |  | 9/08/77  |
|                   |            | 603003                  | 09°06.2'S | 052°01.4'E | 3969              | 3977               |           |  | 9/09/77  |
|                   |            | 604004                  | 02°39.5'S | 051°25.0'E | 5094              | 5094               |           |  | 9/11/77  |
|                   |            | 605005                  | 03°30.5'S | 050°03.5'E | 5069              | 5072               |           |  | 9/13/77  |
|                   |            | 606006                  | 06°29.5'S | 046°59.7'E | 4589              | 4592               |           |  | 9/14/77  |
|                   |            | 607007                  | 10°25.3'S | 044°22.9'E | 3533              | 3533               |           |  | 9/16/77  |
|                   |            | 608008                  | 13°17.6'S | 042°37.2'E | 3328              | 3337               |           |  | 9/17/77  |
|                   |            | 609009                  | 15°50.2'S | 041°50.9'E | 2349              | 2353               |           |  | 9/19/77  |
|                   |            | 610010                  | 13°51.9'S | 044°01.2'E | 3528              | 3529               |           |  | 9/20/77  |
|                   |            | 611011                  | 11°40.2'S | 045°32.9'E | 3421              | 3420               |           |  | 9/21/77  |
|                   |            | 612012                  | 08°30.2'S | 048°04.8'E | 4509              | 4502               |           |  | 9/23/77  |
|                   |            | 613013                  | 08°09.6'S | 044°46.4'E | 4144              | 4144               |           |  | 9/24/77  |
| 343731            | 07         | 701014                  | 02°57.0'S | 046°59.9'E | 4815              | 4817               |           |  | 10/09/77 |
|                   |            | 702015                  | 02°56.2'S | 055°53.1'E | 3370              | 3752               |           |  | 10/12/77 |
|                   |            | 703016                  | 04°54.5'S | 062°50.5'E | 4172              | 4203               |           |  | 10/14/77 |
|                   |            | 704017                  | 08°42.6'S | 069°21.6'E | 3698              | 3711               |           |  | 10/16/77 |
|                   |            | 705018                  | 03°04.0'S | 073°05.4'E | 3187              | 3177               |           |  | 10/22/77 |
|                   |            | 706019                  | 00°11.3'S | 072°04.9'E | 4209              | 4214               |           |  | 10/23/77 |
|                   |            | 707020                  | 05°02.6'N | 070°14.8'E | 4167              | 4176               |           |  | 10/25/77 |
|                   |            | 708021                  | 10°00.9'N | 068°28.9'E | 4486              | 4487               |           |  | 10/27/77 |



APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS (Cont.)

| OPERATION<br>NO. | LEG<br>NO. | SVSTD<br>STATION<br>NO. | POSITION  |            | CORRECTED         |                    | DATE     |
|------------------|------------|-------------------------|-----------|------------|-------------------|--------------------|----------|
|                  |            |                         | LATITUDE  | LONGITUDE  | CAST<br>DEPTH (m) | SONIC<br>DEPTH (m) |          |
| 343802           | 08         | 028001                  | 22°34.8'N | 065°18.2'E | 2332              | 2340               | 11/06/77 |
|                  |            | 027002                  | 21°12.6'N | 064°11.9'E | 3353              | 3338               | 11/07/77 |
|                  |            | 026003                  | 19°57.7'N | 063°14.9'E | 3370              | 3395               | 11/08/77 |
|                  |            | 025004                  | 18°20.1'N | 061°51.7'E | 3709              | 3807               | 11/09/77 |
|                  |            | 024005                  | 17°08.5'N | 061°04.2'E | 3917              | 3912               | 11/09/77 |
|                  |            | 023006                  | 18°14.0'N | 060°03.8'E | 3628              | 3642               | 11/10/77 |
|                  |            | 022007                  | 18°01.6'N | 062°46.2'E | 3647              | 3642               | 11/11/77 |
|                  |            | 021008                  | 17°30.5'N | 064°44.2'E | 3517              | 3520               | 11/12/77 |
|                  |            | 020009                  | 16°53.0'N | 066°58.6'E | 3608              | 3666               | 11/13/77 |
|                  |            | 019010                  | 16°33.4'N | 068°14.6'E | 3587              | 3596               | 11/14/77 |
|                  |            | 018011                  | 17°44.5'N | 068°37.6'E | 3463              | 3470               | 11/14/77 |
|                  |            | 017012                  | 18°18.1'N | 067°05.8'E | 3402              | 3409               | 11/15/77 |
|                  |            | 016013                  | 19°17.6'N | 064°45.8'E | 3204              | 3208               | 11/16/77 |
|                  |            | 015014                  | 20°21.7'N | 062°11.8'E | 3494              | 3502               | 11/17/77 |
|                  |            | 014015                  | 21°10.5'N | 060°43.5'E | 3326              | 3347               | 11/18/77 |
|                  |            | 013016                  | 22°21.7'N | 061°47.5'E | 3130              | 3149               | 11/18/77 |
|                  |            | 012017                  | 21°41.9'N | 063°02.6'E | 3133              | 3128               | 11/19/77 |
|                  |            | 011018                  | 20°41.8'N | 065°17.2'E | 2874              | 2901               | 11/20/77 |
|                  |            | 010019                  | 19°46.5'N | 067°15.1'E | 2920              | 2936               | 11/21/77 |
|                  |            | 008020                  | 19°51.8'N | 068°47.4'E | 2886              | 2891               | 11/22/77 |
|                  |            | 006021                  | 20°30.7'N | 068°40.5'E | 2209              | 2218               | 11/23/77 |
|                  |            | 005022                  | 21°30.5'N | 067°18.2'E | 2168              | 2155               | 11/24/77 |
|                  |            | 004023                  | 22°39.5'N | 065°08.8'E | 2359              | 2359               | 11/24/77 |
|                  |            | 003024                  | 23°26.1'N | 063°29.5'E | 2402              | 2412               | 11/25/77 |
|                  |            | 002025                  | 24°08.4'N | 065°11.5'E | 2278              | 2304               | 11/26/77 |

APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS (Cont.)

| OPERATION<br>NO. | LEG<br>NO. | SVSTD<br>STATION<br>NO. | POSITION  |            | CORRECTED<br>CAST<br>DEPTH (m) | CORRECTED<br>SONIC<br>DEPTH (m) | DATE     |
|------------------|------------|-------------------------|-----------|------------|--------------------------------|---------------------------------|----------|
|                  |            |                         | LATITUDE  | LONGITUDE  |                                |                                 |          |
| 343806           | 22         | 004001                  | 16°32.1'N | 068°26.0'E | 2491                           | 3657                            | 12/04/77 |
|                  |            | 005002                  | 13°32.5'N | 069°14.2'E | 2493                           | 4128                            | 12/05/77 |
|                  |            | 006003                  | 09°55.5'N | 070°06.4'E | 2491                           | 4551                            | 12/07/77 |
|                  |            | 009004                  | 06°44.8'N | 074°32.4'E | 2504                           | 2757                            | 12/09/77 |
|                  |            | 012005                  | 03°26.0'N | 075°57.8'E | 2468                           | 3246                            | 12/10/77 |
|                  |            | 014006                  | 03°24.3'N | 079°46.1'E | 2490                           | 4346                            | 12/12/77 |
|                  |            | 015007                  | 03°28.6'N | 082°00.7'E | 2488                           | 4272                            | 12/12/77 |
|                  |            | 016008                  | 03°29.4'N | 084°51.0'E | 2489                           | 4195                            | 12/13/77 |
|                  |            | 017009                  | 03°24.1'N | 087°02.1'E | 2488                           | 4121                            | 12/14/77 |
|                  |            | 018010                  | 03°24.7'N | 088°19.8'E | 2490                           | 4171                            | 12/15/77 |
|                  |            | 019011                  | 03°27.3'N | 092°13.5'E | 2490                           | 4152                            | 12/16/77 |
|                  |            |                         |           |            |                                |                                 |          |
| 343811           | 18         | 001001                  | 07°38.1'S | 105°53.4'E | 2509                           | 2613                            | 1/07/78  |
|                  |            | 003002                  | 10°54.0'S | 108°33.0'E | 2527                           | 5273                            | 1/09/78  |
|                  |            | 005003                  | 12°57.5'S | 108°19.5'E | 3968                           | 4271                            | 1/10/78  |
|                  |            | 006004                  | 15°09.0'S | 108°01.8'E | 2551                           | 5678                            | 1/11/78  |
|                  |            | 007005                  | 18°55.3'S | 107°42.7'E | 5539                           | 5558                            | 1/14/78  |
|                  |            | 009006                  | 18°48.2'S | 110°16.8'E | 2525                           | 4219                            | 1/15/78  |
|                  |            | 011007                  | 17°05.5'S | 111°43.2'E | 2515                           | 4813                            | 1/16/78  |
|                  |            | 012008                  | 14°44.1'S | 112°22.0'E | 2516                           | 4241                            | 1/17/78  |
|                  |            | 013009                  | 11°50.5'S | 112°44.7'E | 2533                           | 3533                            | 1/18/78  |
|                  |            | 015010                  | 10°50.0'S | 113°14.2'E | 2518                           | 5533                            | 1/19/78  |
|                  |            | 018011                  | 11°30.9'S | 114°47.8'E | 4110                           | 4134                            | 1/20/78  |
|                  |            |                         |           |            |                                |                                 |          |
| 343811           | 26         | 001012                  | 07°03.0'S | 104°52.4'E | 2090                           | 2113                            | 2/04/78  |
|                  |            | 004013                  | 08°11.3'S | 104°04.8'E | 2555                           | 6203                            | 2/05/78  |
|                  |            | 005014                  | 09°40.5'S | 102°42.6'E | 5497                           | 5508                            | 2/06/78  |

APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS (Cont.)

| OPERATION<br>NO.  | LEG<br>NO. | SVSTD<br>STATION<br>NO. | POSITION  |            | CORRECTED         |                    | DATE    |
|-------------------|------------|-------------------------|-----------|------------|-------------------|--------------------|---------|
|                   |            |                         | LATITUDE  | LONGITUDE  | CAST<br>DEPTH (m) | SONIC<br>DEPTH (m) |         |
| 343811<br>(Cont.) | 26         | 006015                  | 09°58.9'S | 098°23.0'E | 2522              | 5151               | 2/07/78 |
|                   |            | 007016                  | 10°17.6'S | 094°81.9'E | 2488              | 5648               | 2/09/78 |
|                   |            | 008017                  | 06°08.2'S | 093°45.2'E | 2522              | 5114               | 2/11/78 |
|                   |            | 009018                  | 01°35.7'S | 093°20.2'E | 4635              | 4643               | 2/13/78 |
|                   |            | 011019                  | 02°48.1'N | 093°59.3'E | 2516              | 4675               | 2/14/78 |
|                   |            | 013020                  | 04°30.8'N | 092°28.0'E | 4231              | 4236               | 2/16/78 |
|                   |            | 014021                  | 07°00.7'N | 091°22.9'E | 2524              | 3669               | 2/17/78 |
|                   |            | 015022                  | 08°55.1'N | 090°39.3'E | 2546              | 3219               | 2/18/78 |
|                   |            | 016023                  | 08°50.2'N | 019°39.1'E | 2507              | 3370               | 2/19/78 |
|                   |            | 018024                  | 09°14.8'N | 095°01.6'E | 1982              | 1993               | 2/20/78 |
|                   |            | 012001                  | 07°15.0'N | 094°49.0'E | 2644              | 2645               | 3/10/78 |
|                   |            | 010002                  | 09°56.1'N | 094°09.5'E | 2516              | 3116               | 3/11/78 |
| 343815            | 17         | 009003                  | 09°57.8'N | 089°01.3'E | 3344              | 3375               | 3/13/78 |
|                   |            | 007004                  | 06°51.3'N | 084°51.8'E | 3851              | 3870               | 3/15/78 |
|                   |            | 006005                  | 03°21.5'N | 086°26.5'E | 2529              | 4179               | 3/16/78 |
|                   |            | 005006                  | 01°03.1'N | 084°59.4'E | 4449              | 4479               | 3/18/78 |
|                   |            | 004007                  | 03°01.8'N | 083°27.8'E | 2527              | 4235               | 3/19/78 |
|                   |            | 003008                  | 05°03.0'N | 082°18.5'E | 4145              | 4158               | 3/20/78 |
|                   |            | 002009                  | 04°41.0'N | 077°34.4'E | 2751              | 2749               | 3/22/78 |
|                   |            | 001010                  | 06°22.3'N | 077°21.9'E | 2277              | 2288               | 3/23/78 |
|                   |            | 016011                  | 04°06.3'N | 081°10.3'E | 2472              | 4300               | 4/06/78 |
|                   |            | 015012                  | 01°27.3'N | 082°21.1'E | 2494              | 4409               | 4/07/78 |
|                   |            | 014013                  | 03°59.3'S | 085°14.3'E | 2507              | 4856               | 4/09/78 |
|                   |            | 013014                  | 08°05.3'S | 086°46.3'E | 5298              | 5425               | 4/11/78 |
| 343815            | 20         | 012015                  | 10°06.8'S | 088°02.9'E | 2501              | 4900               | 4/12/78 |
|                   |            | 011016                  | 11°19.9'S | 088°42.3'E | 1639              | 1660               | 4/13/78 |

APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS (Cont.)

| OPERATION<br>NO.  | LEG<br>NO. | SVSTD<br>STATION<br>NO. | POSITION  |            | CORRECTED |      | CORRECTED |                    | DATE    |
|-------------------|------------|-------------------------|-----------|------------|-----------|------|-----------|--------------------|---------|
|                   |            |                         | LATITUDE  | LONGITUDE  | DEPTH (m) | CAST | DEPTH (m) | SONIC<br>DEPTH (m) |         |
| 343815<br>(Cont.) | 20         | 010017                  | 11°47.8'S | 089°29.1'E | 2512      |      | 5365      |                    | 4/13/78 |
|                   |            | 009018                  | 12°24.0'S | 090°23.4'E | 2435      |      | 5473      |                    | 4/13/78 |
|                   |            | 008019                  | 12°54.9'S | 091°17.2'E | 5832      |      | 5834      |                    | 4/13/78 |
|                   |            | 007020                  | 13°28.8'S | 092°11.2'E | 2508      |      | 5063      |                    | 4/15/78 |
|                   |            | 206021                  | 14°46.1'S | 094°15.9'E | 2517      |      | 5838      |                    | 4/16/78 |
|                   |            | 205022                  | 15°59.4'S | 096°10.2'E | 2529      |      | 5373      |                    | 4/17/78 |
|                   |            | 204023                  | 17°04.5'S | 097°54.1'E | 2532      |      | 5233      |                    | 4/18/78 |
|                   |            | 201024                  | 15°33.6'S | 106°10.3'E | 6028      |      | 6112      |                    | 4/21/78 |
|                   |            |                         |           |            |           |      |           |                    |         |
|                   |            |                         |           |            |           |      |           |                    |         |
|                   |            |                         |           |            |           |      |           |                    |         |
|                   |            |                         |           |            |           |      |           |                    |         |
| 343821            | 27         | 003002                  | 08°00.3'S | 097°59.8'E | 3012      |      | 4943      |                    | 7/01/78 |
|                   |            | 005003                  | 08°01.7'S | 094°55.9'E | 4842      |      | 5108      |                    | 7/03/78 |
|                   |            | 007004                  | 07°58.1'S | 089°49.1'E | 2513      |      | 5183      |                    | 7/05/78 |
|                   |            | 009005                  | 08°00.0'S | 086°57.5'E | 2532      |      | 5193      |                    | 7/06/78 |
|                   |            | 010006                  | 08°00.1'S | 082°59.2'E | 2584      |      | 5126      |                    | 7/07/78 |
|                   |            | 012008                  | 01°59.4'S | 081°41.9'E | 2548      |      | 4785      |                    | 7/10/78 |
|                   |            | 013009                  | 00°00.2'S | 081°10.5'E | 4605      |      | 4598      |                    | 7/10/78 |
|                   |            | 014010                  | 02°02.6'N | 080°48.8'E | 2569      |      | 4484      |                    | 7/11/78 |
|                   |            | 015011                  | 04°00.4'N | 080°21.5'E | 2563      |      | 4344      |                    | 7/12/78 |
|                   |            | 011007                  | 04°00.2'S | 082°02.2'E | 2606      |      | 4947      |                    | 7/09/78 |
|                   |            |                         |           |            |           |      |           |                    |         |
|                   |            |                         |           |            |           |      |           |                    |         |
| 343821            | 10         | 001012                  | 08°23.6'N | 075°20.4'E | 2026      |      | 2032      |                    | 7/21/78 |
|                   |            | 002013                  | 08°37.9'N | 074°30.1'E | 2553      |      | 2755      |                    | 7/21/78 |
|                   |            | 003014                  | 09°53.3'N | 074°10.9'E | 2470      |      | 2474      |                    | 7/22/78 |
|                   |            | 004015                  | 10°39.4'N | 073°58.2'E | 2216      |      | 2229      |                    | 7/22/78 |
|                   |            | 005016                  | 11°44.7'N | 073°40.7'E | 2067      |      | 2064      |                    | 7/23/78 |
|                   |            | 006017                  | 13°20.6'N | 072°55.2'E | 1870      |      | 1864      |                    | 7/23/78 |
|                   |            | 007018                  | 14°31.2'N | 072°10.6'E | 2067      |      | 2065      |                    | 7/24/78 |
|                   |            | 009019                  | 15°55.2'N | 071°12.4'E | 2473      |      | 2472      |                    | 7/25/78 |
|                   |            | 010020                  | 16°54.9'N | 070°40.2'E | 3027      |      | 3037      |                    | 7/25/78 |
|                   |            |                         |           |            |           |      |           |                    |         |
|                   |            |                         |           |            |           |      |           |                    |         |
|                   |            |                         |           |            |           |      |           |                    |         |

APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS (Cont.)

| OPERATION<br>NO.  | LEG<br>NO. | SVSTD<br>STATION<br>NO. | POSITION  |            | CORRECTED         |                    | DATE     |
|-------------------|------------|-------------------------|-----------|------------|-------------------|--------------------|----------|
|                   |            |                         | LATITUDE  | LONGITUDE  | CAST<br>DEPTH (m) | SONIC<br>DEPTH (m) |          |
| 343821<br>(Cont.) | 10         | 011021                  | 17°44.4'N | 070°04.0'E | 2648              | 2936               | 7/26/78  |
|                   |            | 012022                  | 18°43.3'N | 069°22.1'E | 2843              | 3094               | 7/26/78  |
|                   |            | 013023                  | 19°51.1'N | 068°36.3'E | 3071              | 3082               | 7/27/78  |
|                   |            | 014024                  | 20°54.4'N | 068°14.3'E | 2589              | 2602               | 7/27/78  |
| 343827            | 11         | 001001                  | 19°03.3'N | 069°37.4'E | 1364              | 1372               | 9/05/78  |
|                   |            | 002002                  | 18°26.0'N | 069°12.2'E | 2519              | 3167               | 9/05/78  |
|                   |            | 003003                  | 17°39.3'N | 068°50.1'E | 2514              | 3483               | 9/06/78  |
|                   |            | 004004                  | 15°45.5'N | 067°39.9'E | 2514              | 3810               | 9/07/78  |
|                   |            | 005005                  | 13°28.8'N | 066°14.3'E | 2514              | 4036               | 9/08/78  |
|                   |            | 006006                  | 10°33.3'N | 064°34.4'E | 2533              | 4371               | 9/09/78  |
|                   |            | 007007                  | 08°05.9'N | 063°03.9'E | 4384              | 4403               | 9/10/78  |
|                   |            | 008008                  | 05°21.2'N | 061°25.4'E | 2618              | 3041               | 9/11/78  |
|                   |            | 009009                  | 05°32.2'N | 066°49.7'E | 2501              | 3404               | 9/13/78  |
|                   |            | 010010                  | 07°59.1'N | 066°50.0'E | 2503              | 4614               | 9/14/78  |
|                   |            | 011011                  | 07°59.7'N | 070°56.2'E | 4122              | 4126               | 9/15/78  |
| 343827            | 12         | 012012                  | 15°35.0'S | 073°57.8'E | 2514              | 4908               | 10/06/78 |
|                   |            | 013013                  | 11°03.2'S | 073°58.6'E | 5083              | 5084               | 10/07/78 |
|                   |            | 014014                  | 05°52.5'S | 074°12.6'E | 2509              | 4601               | 10/09/78 |
|                   |            | 015015                  | 01°52.6'S | 074°31.2'E | 4850              | 4750               | 10/10/78 |
|                   |            | 016016                  | 02°18.5'N | 075°01.1'E | 2341              | 2336               | 10/12/78 |
|                   |            | 017017                  | 04°27.5'N | 075°16.0'E | 2389              | 2397               | 10/12/78 |
|                   |            |                         |           |            |                   |                    |          |
| 343828            | 15         | 001001                  | 02°08.5'N | 070°21.0'E | 2523              | 4109               | 10/27/78 |
|                   |            | 002002                  | 03°28.8'N | 071°44.0'E | 3965              | 3987               | 10/28/78 |
|                   |            | 003003                  | 05°23.5'N | 073°56.0'E | 2509              | 2521               | 10/29/78 |
|                   |            | 004004                  | 06°10.0'N | 074°38.2'E | 2745              | 2748               | 10/29/78 |

APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS (Cont.)

| OPERATION<br>NO.  | LEG<br>NO. | SVSTD<br>STATION<br>NO. | POSITION  |            | CORRECTED         |                    | CORRECTED |  | DATE     |
|-------------------|------------|-------------------------|-----------|------------|-------------------|--------------------|-----------|--|----------|
|                   |            |                         | LATITUDE  | LONGITUDE  | CAST<br>DEPTH (m) | SONIC<br>DEPTH (m) |           |  |          |
| 343828<br>(Cont.) | 15         | 005005                  | 07°09.2'N | 075°30.5'E | 1754              | 1733               |           |  | 10/29/78 |
|                   |            | 006006                  | 08°00.1'N | 076°21.7'E | 1183              | 1205               |           |  | 10/30/78 |
|                   |            | 007007                  | 10°01.7'N | 074°55.9'E | 2197              | 2204               |           |  | 10/31/78 |
|                   |            | 008008                  | 11°53.9'N | 073°55.3'E | 1957              | 1962               |           |  | 11/01/78 |
|                   |            | 009009                  | 10°28.7'N | 071°54.8'E | 1865              | 1876               |           |  | 11/03/78 |
|                   |            | 010010                  | 09°38.1'N | 070°40.6'E | 2528              | 4317               |           |  | 11/03/78 |
|                   |            | 011011                  | 08°01.5'N | 068°19.7'E | 4643              | 4696               |           |  | 11/04/78 |
|                   |            |                         |           |            |                   |                    |           |  |          |
|                   |            |                         |           |            |                   |                    |           |  |          |
|                   |            |                         |           |            |                   |                    |           |  |          |
|                   |            |                         |           |            |                   |                    |           |  |          |
| 343828            | 13         | 012012                  | 06°17.4'N | 082°12.7'E | 2539              | 4021               |           |  | 11/19/78 |
|                   |            | 013013                  | 08°56.4'N | 082°34.3'E | 2510              | 3745               |           |  | 11/20/78 |
|                   |            | 014014                  | 13°13.6'N | 083°47.6'E | 3294              | 3301               |           |  | 11/21/78 |
|                   |            | 015015                  | 17°58.9'N | 084°48.2'E | 2339              | 2408               |           |  | 11/23/78 |
|                   |            | 016016                  | 18°56.1'N | 087°52.9'E | 2239              | 2248               |           |  | 11/24/78 |
|                   |            | 017017                  | 15°23.4'N | 086°34.9'E | 2501              | 2856               |           |  | 11/25/78 |
|                   |            | 018018                  | 09°09.0'N | 084°18.0'E | 3658              | 3666               |           |  | 11/27/78 |
|                   |            | 019019                  | 11°27.8'N | 089°28.5'E | 2501              | 3168               |           |  | 12/03/78 |
|                   |            |                         |           |            |                   |                    |           |  |          |
|                   |            |                         |           |            |                   |                    |           |  |          |
| 343901            | 14         | 104001                  | 07°51.7'N | 086°13.8'E | 3745              | 3756               |           |  | 1/12/79  |
|                   |            | 105002                  | 11°26.6'N | 087°20.0'E | 2519              | 3298               |           |  | 1/14/79  |
|                   |            | 107003                  | 20°00.0'N | 089°57.9'E | 1303              | 1325               |           |  | 1/17/79  |
|                   |            | 100004                  | 11°34.3'N | 090°26.4'E | 2523              | 3158               |           |  | 1/20/79  |
|                   |            | 111005                  | 10°01.1'N | 090°24.0'E | 2515              | 3335               |           |  | 1/21/79  |
|                   |            | 113006                  | 07°02.3'N | 090°40.1'E | 2520              | 2900               |           |  | 1/22/79  |
|                   |            | 114007                  | 04°22.6'N | 090°53.7'E | 2429              | 2439               |           |  | 1/22/79  |
|                   |            | 116008                  | 01°01.2'N | 089°27.9'E | 2492              | 3046               |           |  | 1/24/79  |
|                   |            | 117009                  | 01°01.4'N | 084°57.9'E | 2515              | 4484               |           |  | 1/25/79  |
|                   |            | 118010                  | 01°01.8'N | 080°00.6'E | 4607              | 4566               |           |  | 1/26/79  |

APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS (Cont.)

| OPERATION<br>NO. | LEG<br>NO. | SVSTD<br>STATION<br>NO. | POSITION  |            | CORRECTED         |                    | CORRECTED |  | DATE    |
|------------------|------------|-------------------------|-----------|------------|-------------------|--------------------|-----------|--|---------|
|                  |            |                         | LATITUDE  | LONGITUDE  | CAST<br>DEPTH (m) | SONIC<br>DEPTH (m) |           |  |         |
| 343901           | 21         | 205011                  | 04°57.8'N | 087°58.0'E | 3987              | 3989               |           |  | 2/10/79 |
|                  |            | 206012                  | 02°59.4'N | 087°51.2'E | 2514              | 4216               |           |  | 2/11/79 |
|                  |            | 207013                  | 01°00.3'N | 087°48.2'E | NR                | 4411               |           |  | 2/11/79 |
|                  |            | 208014                  | 01°00.3'S | 087°48.7'E | NR                | 4641               |           |  | 2/12/79 |
|                  |            | 209015                  | 03°01.2'S | 087°43.5'E | 2527              | 4792               |           |  | 2/13/79 |
|                  |            | 210016                  | 04°59.7'S | 087°46.5'E | NR                | 5060               |           |  | 2/14/79 |
|                  |            | 224017                  | 03°31.4'S | 082°38.2'E | 3553              | 3550               |           |  | 2/17/79 |
|                  |            | 220018                  | 04°36.8'S | 077°07.1'E | 4773              | 4773               |           |  | 2/19/79 |
|                  |            | 220019                  | 00°44.2'N | 077°01.9'E | 4404              | 4285               |           |  | 2/21/79 |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            | 015003                  | 12°29.2'S | 062°29.4'E |                   |                    |           |  | 4/06/79 |
|                  |            | 016004                  | 12°29.3'S | 064°06.4'E |                   |                    |           |  | 4/07/79 |
|                  |            | 017005                  | 12°29.9'S | 065°03.0'E |                   |                    |           |  | 4/07/79 |
|                  |            | 018006                  | 12°29.1'S | 065°53.9'E |                   |                    |           |  | 4/08/79 |
|                  |            | 019007                  | 12°27.9'S | 066°45.0'E |                   |                    |           |  | 4/08/79 |
|                  |            | 020008                  | 12°28.8'S | 067°33.2'E |                   |                    |           |  | 4/09/79 |
|                  |            | 021009                  | 12°29.2'S | 067°58.5'E |                   |                    |           |  | 4/09/79 |
|                  |            | 022010                  | 12°28.6'S | 068°59.0'E |                   |                    |           |  | 4/09/79 |
|                  |            | 023011                  | 12°33.2'S | 070°18.5'E |                   |                    |           |  | 4/10/79 |
|                  |            | 024012                  | 12°28.1'S | 071°31.3'E |                   |                    |           |  | 4/10/79 |
|                  |            | 025013                  | 12°29.3'S | 071°59.9'E |                   |                    |           |  | 4/11/79 |
|                  |            | 026014                  | 12°29.4'S | 072°46.4'E |                   |                    |           |  | 4/11/79 |
|                  |            | 027015                  | 12°34.2'S | 074°01.6'E |                   |                    |           |  | 4/12/79 |
|                  |            | 032016                  | 12°34.4'S | 075°33.8'E |                   |                    |           |  | 4/12/79 |
|                  |            | 033017                  | 12°29.6'S | 076°56.9'E |                   |                    |           |  | 4/13/79 |
|                  |            | 034018                  | 12°28.5'S | 078°29.8'E |                   |                    |           |  | 4/14/79 |
|                  |            | 035019                  | 12°31.5'S | 080°01.0'E |                   |                    |           |  | 4/14/79 |
|                  |            | 036020                  | 12°33.3'S | 081°31.6'E |                   |                    |           |  | 4/15/79 |
| 343907           | 24         |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |
|                  |            |                         |           |            |                   |                    |           |  |         |

APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS (Cont.)

| OPERATION<br>NO.  | LEG<br>NO. | SVSTD<br>STATION<br>NO. | LATITUDE  | POSITION<br>LONGITUDE | CORRECTED<br>CAST<br>DEPTH (m) | CORRECTED<br>SONIC<br>DEPTH (m) | DATE    |
|-------------------|------------|-------------------------|-----------|-----------------------|--------------------------------|---------------------------------|---------|
| 343907<br>(Cont.) | 24         | 037021                  | 12°31.0'S | 082°54.7'E            |                                |                                 | 4/15/79 |
|                   |            | 038022                  | 12°28.0'S | 084°15.6'E            |                                |                                 | 4/16/79 |
|                   |            | 039023                  | 12°29.2'S | 085°15.4'E            |                                |                                 | 4/16/79 |
|                   |            | 040024                  | 12°29.9'S | 086°27.7'E            |                                |                                 | 4/17/79 |
|                   |            | 041025                  | 12°29.7'S | 087°23.3'E            |                                |                                 | 4/17/79 |
|                   |            | 042026                  | 12°29.2'S | 087°59.0'E            |                                |                                 | 4/18/79 |
|                   |            | 043027                  | 11°31.0'S | 087°59.9'E            |                                |                                 | 4/18/79 |
|                   |            | 044028                  | 10°19.7'S | 088°18.7'E            |                                |                                 | 4/18/79 |
|                   |            | 045029                  | 09°59.3'S | 088°18.0'E            |                                |                                 | 4/19/79 |
|                   |            | 045030                  | 10°33.6'S | 088°09.5'E            |                                |                                 | 4/19/79 |
|                   |            | 046031                  | 08°28.1'S | 088°19.5'E            |                                |                                 | 4/20/79 |
|                   |            | 048032                  | 07°04.9'S | 088°37.8'E            |                                |                                 | 4/20/79 |
|                   |            | 049033                  | 05°41.1'S | 088°31.7'E            |                                |                                 | 4/21/79 |
|                   |            | 050034                  | 04°37.8'S | 088°36.5'E            |                                |                                 | 4/21/79 |
|                   |            | 051035                  | 03°54.7'S | 088°25.7'E            |                                |                                 | 4/22/79 |
| 343907            | 25         | 052036                  | 03°02.9'S | 088°28.0'E            |                                |                                 | 4/22/79 |
|                   |            | 053037                  | 02°51.0'S | 088°29.9'E            |                                |                                 | 4/22/79 |
|                   |            | 054038                  | 02°36.2'S | 088°47.1'E            |                                |                                 | 4/22/79 |
|                   |            | 054039                  | 02°22.4'S | 088°39.9'E            |                                |                                 | 4/22/79 |
|                   |            | 055040                  | 01°11.0'S | 088°37.2'E            |                                |                                 | 4/23/79 |
| 343908            | 16         | 056041                  | 00°10.0'N | 088°55.9'E            |                                |                                 | 4/24/79 |
|                   |            | 057042                  | 01°00.0'N | 088°31.3'E            |                                |                                 | 4/24/79 |
|                   |            | 006001                  | 01°58.9'N | 080°45.3'E            | 2493                           | 4486                            | 5/08/79 |
|                   |            | 007002                  | 00°08.6'N | 081°40.5'E            | 2502                           | 4587                            | 5/09/79 |
|                   |            | 008003                  | 00°57.9'S | 081°50.0'E            | 2507                           | 4697                            | 5/09/79 |
|                   |            | 009004                  | 01°58.7'S | 081°25.6'E            | 2494                           | 4804                            | 5/10/79 |



APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS (Cont.)

| OPERATION<br>NO.  | LEG<br>NO. | SVSTD<br>STATION<br>NO. | POSITION  |            | CORRECTED         |                    | DATE    |
|-------------------|------------|-------------------------|-----------|------------|-------------------|--------------------|---------|
|                   |            |                         | LATITUDE  | LONGITUDE  | CAST<br>DEPTH (m) | SONIC<br>DEPTH (m) |         |
| 343908<br>(Cont.) | 16         | 010005                  | 03°00.7'S | 081°24.0'E | 2923              | 5025               | 5/10/79 |
|                   |            | 020006                  | 07°15.2'S | 072°32.6'E | 1045              | 1548               | 5/28/79 |
|                   |            | 020007                  | 07°19.7'S | 072°33.0'E |                   | 1079               | 5/28/79 |
|                   |            | 020008                  | 07°19.0'S | 072°38.0'E | 2279              | 2237               | 5/28/79 |
|                   |            | 020009                  | 07°20.1'S | 072°35.9'E | 1974              | 2077               | 5/28/79 |
|                   |            | 020010                  | 07°23.9'S | 072°32.7'E | 1392              | 1385               | 5/29/79 |
|                   |            | 020011                  | 07°20.4'S | 072°36.9'E | 2198              | 2197               | 5/29/79 |
|                   |            | 020012                  | 07°19.5'S | 072°37.3'E | 2283              | 2283               | 5/29/79 |
|                   |            | 020013                  | 07°23.6'S | 072°37.2'E | 2291              | 2243               | 5/29/79 |
|                   |            | 020014                  | 07°23.6'S | 072°41.7'E | 2870              | 2957               | 5/30/79 |
|                   |            | 020015                  | 07°20.3'S | 072°35.5'E | 1774              | 1798               | 5/30/79 |
|                   |            | 020016                  | 07°19.5'S | 072°37.7'E | 2299              | 2306               | 5/30/79 |
|                   |            | 020018                  | 07°14.8'S | 072°41.1'E | 2324              | 2329               | 5/30/79 |
|                   |            | 020019                  | 07°15.5'S | 072°37.0'E | 2140              | 2189               | 5/31/79 |
|                   |            | 020020                  | 07°17.0'S | 072°38.4'E | 2335              | 2218               | 5/31/79 |
|                   |            | 020021                  | 07°20.3'S | 072°32.0'E | 2216              | 2208               | 5/31/79 |
| 343916            | 29         | 020022                  | 07°20.6'S | 072°36.5'E | 2182              | 2170               | 5/31/79 |
|                   |            | 020023                  | 07°21.5'S | 072°36.0'E | 2107              | 2100               | 5/31/79 |
|                   |            | 020024                  | 07°21.9'S | 072°40.0'E | 2260              | 2227               | 5/31/79 |
|                   |            | 020025                  | 07°17.7'S | 072°34.6'E | 1863              | 1859               | 5/31/79 |
|                   |            | 101001                  | 00°04.0'N | 050°54.1'E | 1500              | 5088               | 8/18/79 |
|                   |            | 102002                  | 00°56.7'N | 050°01.9'E | 1500              | 5075               | 8/18/79 |
|                   |            | 103003                  | 02°13.4'N | 049°11.1'E | 1504              | 4494               | 8/18/79 |
|                   |            | 104004                  | 03°08.0'N | 048°34.1'E | 1510              | 3414               | 8/19/79 |
|                   |            | 105005                  | 03°36.3'N | 048°21.8'E | 1500              | 3173               | 8/19/79 |
|                   |            | 106006                  | 03°57.3'N | 048°08.4'E | 0854              | 0865               | 8/19/79 |

APPENDIX C. OCEANOGRAPHIC STATION LOCATIONS (Cont.)

| OPERATION<br>No.  | LEG<br>NO. | SVSTD<br>STATION<br>NO. | POSITION  |            | CORRECTED         |                    | DATE    |
|-------------------|------------|-------------------------|-----------|------------|-------------------|--------------------|---------|
|                   |            |                         | LATITUDE  | LONGITUDE  | CAST<br>DEPTH (m) | SONIC<br>DEPTH (m) |         |
| 343916<br>(cont.) | 29         | 107007                  | 04°14.6'N | 048°33.1'E | 1311              | 1382               | 8/20/79 |
|                   |            | 108008                  | 04°20.9'N | 049°29.3'E | 1510              | 2953               | 8/20/79 |
|                   |            | 109009                  | 04°40.5'N | 050°31.0'E | 1510              | 4468               | 8/20/79 |
|                   |            | 110010                  | 05°00.8'N | 051°52.6'E | 1514              | 5094               | 8/21/79 |
|                   |            | 111011                  | 05°33.3'N | 053°20.5'E | 1510              | 5027               | 8/21/79 |
|                   |            | 112012                  | 05°55.6'N | 055°27.6'E | 1500              | 4659               | 8/22/79 |
|                   |            | 113013                  | 06°18.5'N | 057°39.4'E | 1506              | 4264               | 8/22/79 |
|                   |            | 114014                  | 08°21.9'N | 053°35.4'E | 1500              | 5037               | 8/24/79 |
|                   |            | 115015                  | 08°27.1'N | 051°43.7'E | 4497              | 4422               | 8/25/79 |
|                   |            | 116016                  | 08°37.8'N | 051°17.6'E | 1502              | 3818               | 8/26/79 |
|                   |            | 117017                  | 08°52.2'N | 050°57.3'E | 0948              | 0988               | 8/26/79 |
|                   |            | 118018                  | 09°43.7'N | 052°05.1'E | 1506              | 3858               | 8/27/79 |
|                   |            | 119020                  | 11°15.5'N | 052°31.6'E | 1505              | 2253               | 8/27/79 |
|                   |            | 120021                  | 10°16.2'N | 053°30.6'E | 4176              | 4201               | 8/28/79 |
|                   |            | 121022                  | 09°20.0'N | 054°31.7'E | 1502              | 4739               | 8/28/79 |
|                   |            | 122023                  | 11°04.8'N | 055°54.2'E | 4204              | 4220               | 8/29/79 |
|                   |            | 123026                  | 13°39.4'N | 056°11.1'E | 1512              | 3450               | 8/30/79 |
|                   |            | 124027                  | 11°54.3'N | 057°31.1'E | 1507              | 3073               | 8/30/79 |
|                   |            | 125028                  | 09°54.9'N | 059°14.9'E | 1528              | 4027               | 8/31/79 |
|                   |            | 126029                  | 09°07.3'N | 057°03.0'E | 1505              | 3910               | 9/01/79 |
|                   |            | 127030                  | 07°34.6'N | 055°10.3'E | 1501              | 5107               | 9/01/79 |
| 393916            | 30         | 201001                  | 01°29.2'N | 052°57.2'E | 5109              | 5113               | 9/15/79 |
|                   |            | 202002                  | 03°16.6'N | 051°10.9'E | 2507              | 5154               | 9/16/79 |
|                   |            | 203003                  | 04°33.6'N | 049°32.2'E | 2501              | 3125               | 9/17/79 |
|                   |            | 204004                  | 05°38.0'N | 050°29.1'E | 2492              | 4764               | 9/17/79 |
|                   |            | 205005                  | 03°51.4'N | 052°20.0'E | 5099              | 5107               | 9/18/79 |
|                   |            | 206006                  | 02°42.5'N | 054°14.0'E | 2463              | 5044               | 9/19/79 |